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# MODERN MEDICINE

AND

# BACTERIOLOGICAL REVIEW

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VOLUME V

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| 1 46 | 7.12 | 12.45 | 12.40 | | Cassopolis | 2.15 | 9.40 | 5.12 | | 3.2 |
| 2.33 | | †1.33 | 3.42 | | Schoolcraft | 1.30 | | | | |
| 2.44 | 7.55 | 1.43 | 4.50 | a m | Vicksburg | 1.10 | 8.52 | | p m | 2.1 |
| 3.30 | 8.36 | 2.40 | 6.20 | 7.00 | Battle Creek | 12.15 | 8.15 | 3.55 | 9.25 | 1.1 |
| 4.33 | 9.26 | 3.25 | | 7.47 | Charlotte | 11.14 | 7.22 | 3.07 | 8.40 | 12.1 |
| 5.10 | 9.55 | 4.00 | | 8.20 | Lansing | 10.40 | 6.55 | 2.40 | 8.00 | 12.2 |
| 6.30 | 10.45 | 5.08 | | 9.30 | Durand | 9.35 | 6.05 | 1.55 | 6.50 | 11.2 |
| 7.30 | 11.17 | 5.40 | | 10.05 | Flint | 9.05 | 5.35 | 1.28 | 5.47 | 10.5 |
| 8.15 | 11.50 | 6.15 | | 10.43 | Lapeer | 7.49 | 5.02 | 1.00 | 5.10 | 10.0 |
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| | 8.15 | 7.25 | | | Montreal | | 9.15 | | | |
| | a m | p m | | | | | a m | | | |
| | 8.12 | 7.15 | | | Boston | | 8.30 | | | |
| | a m | p m | | | | | p m | a m | | p m |
| | 7.50 | 4.25 | | | Susp'n Bridge | | 10.15 | 7.05 | | 2.2 |
| | a m | p m | | | | | | | | p m |
| | 7.00 | 5.40 | | | Buffalo | | | | | 1.0 |
| | p m | a m | | | | | a m | p m | | p m |
| | 8.53 | 8.03 | | | New York | | 8.15 | 8.10 | | 8.0 |
| | | a m | | | | | | | | p m |
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## The Treatment of Influenza or La Grippe.

It is quite refreshing these days to read of a clearly defined treatment for the grip. But in an article in the *Lancet-Clinic*, December 28th, 1895, Dr. James Hervey Bell, 251 East 32d Street, New York City, says he is convinced that too much medication is both unnecessary and injurious. He has few remedies; prescribes them with confidence; and "trusts the rest to nature."

When called to a case of influenza, the patient is usually seen when the fever is present, as the chill, which occasionally ushers in the disease, has generally passed away. Dr. Bell says he then orders that the bowels be opened freely by some saline draught, as hunyadi water or effervescing citrate of magnesia.

For the high fever, severe headache, pain, and general soreness, the following is ordered:

℞ Antikamnia Tablets (5 gr. each), No. xxx.
Sig. One tablet every two hours.

If the pain is extremely severe, the dose is doubled until relief is obtained. Often this single dose of ten grains of antikamnia is followed with almost complete relief from the suffering. Antikamnia is preferred to the hypodermic use of morphia because it leaves no bad after-effects; and also because it has such marked power to control pain and reduce fever. The author says that unless the attack is a very severe one, the above treatment is sufficient.

After the fever has subsided, the pain, muscular soreness and nervousness generally continue for some time. To relieve these and to meet the indication for a tonic, the following is prescribed:

℞ Antikamnia & Quinine Tablets, No. xxx.
Sig. One tablet three times a day.

This tablet contains two and one-half grains of each of the drugs, and answers every purpose until health is restored.

Occasionally the muscular soreness is the most prominent symptom. In such cases the following combination is preferred to antikamnia alone:

℞ Antikamnia & Salol Tablets, No. xxx.
Sig. One tablet every two hours.

This tablet contains two and one-half grains of each drug.

Then again it occurs that the most prominent symptom is an irritative cough. A useful prescription for this is one-fourth of a grain sulphate codeine and four and three-fourths grains antikamnia. Thus:

℞ Antikamnia & Codeine Tablets, No. xxx.
Sig. One tablet every four hours.

Dr. Bell also says that in antikamnia alone we have a remedy sufficient for the treatment of nearly every case, but occasionally one of its combinations meets special conditions. He always instructs patients to crush tablets before taking.

# MODERN MEDICINE

• • AND • •

# BACTERIOLOGICAL REVIEW.

VOL. V. BATTLE CREEK, MICH., U. S. A., JANUARY, 1896. NO. 1.


## ORIGINAL ARTICLES.

### THE INCANDESCENT ELECTRIC-LIGHT, OR RADIANT-HEAT BATH.

BY J. H. KELLOGG, M. D.

(Concluded.)

THE physiological effects of the electric-light bath are chiefly those of heat, and do not differ very essentially from the effects obtained from other sources of heat, except that the electric-light bath is a much more efficient and convenient method of administering heat than any other which has been devised, with the exception of water, which doubtless has a wider range of use.

The purposes for which heat is applied are usually two:—

1. The induction of perspiration.

2. The stimulation of protoplasmic activity, and thus increase of tissue metamorphosis. As before remarked, Bouchard has shown that a rise of temperature of .40 degrees C. (.72 degrees F.) is sufficient to induce perspiration. This rise of temperature may be produced either by artificial heat, by the retention of bodily heat, through diminished heat elimination, or by increased production of heat through exercise or other means.

In the Turkish bath a high temperature of the surrounding atmosphere and a considerable amount of time is required for the induction of perspiration, for the reason that the heat of the air is slowly communicated to the body by the heating of the skin, and through it, the transmission of heat to the blood is directly antagonized by the rapid evaporation produced by exposure to a dry atmosphere whereby the skin is rapidly cooled. This cooling may take place so rapidly, indeed, that a temperature of several hundred degrees may be tolerated for a short period without injury, as was illustrated by the Fire King who used to enter an oven with a piece of raw beef and remain until it was roasted.

In the incandescent electric-light bath the heat enters the body directly as a radiant force, instead of by the slow method of convection and conduction, thus more rapidly raising the temperature of the blood, and hence quickly inducing perspiration. That heat stimulates vital activity is a fact which with every one who has ever studied the ameba, or white blood corpuscle, upon the warming stage is well acquainted. The effect of poultices and fomentations in producing pigmentation of the skin, as well as the effects of intense heat, either from the sun or other incandescent sources upon the complexion, afford further evidences of the important physiological effects of heat. Entering the body directly, instead of slowly working its way through the poor conductors which are found in the successive layers of tissue which compose the covering of the body, the radiant heat of the incandescent electric light stimulates and vitalizes the tissues to a high degree.

*Therapeutic Uses.*— I have found the electric-light bath of far greater value in the treatment of a great variety of maladies than any other means of applying heat, except water, and find that it may be much more generally employed than the ordinary Turkish, Russian, vapor, or hot-air baths. One reason of this is the convenience and rapidity with which the degree of heat employed may be graduated by turning on or off one or more groups of lamps, by which means the amount of heat is rendered absolutely and instantly controllable. The source of heat relied upon is the incandescent filaments of the lamps rather than a heated

W250

atmosphere, and hence is easily and instantly controllable.

The instant the lamp is turned off, the heat which it has previously emitted is withdrawn from operation. If additional heat is required, the desired number of lamps may be turned on and become instantly operative.

Another reason for the more universal application of the incandescent electric-light bath is the fact that when properly applied, its effects are highly tonic in character. A short application of the bath at full force for a time just sufficient to induce powerful stimulation of the skin without provoking perspiration, is one of the most effective means of peripheral stimulation with which I am acquainted. The tonic effects of such an application may be still further intensified by instantly following the bath with a cold spray or other cold application, thus producing a revulsive effect of the most agreeable and effective character. The excessive heating of the skin prepares the way for the cold application, without at the same time so overheating and relaxing the blood-vessels as to render recovery of the tone of the cutaneous tissues so tardy as to involve the risk of exhausting the patient too greatly or exposing him to the liability of taking cold.

The advantages of the incandescent electric light over the arc light for therapeutic applications are: —

1. Its superior convenience in application and distribution in the bath.

2. Freedom from the deleterious effects which several observers have noted as due to the arc light when in too close proximity to plants, or when nearer than two meters. These effects were found to be due, not to the gases given off by the lamp, but to some effect from the light itself. It cannot be doubted that similar deleterious effects might follow the use of the arc light when applied for therapeutic purposes, if placed nearer to the patient than six feet, a fact which must render its use inconvenient, if not dangerous, to say nothing of the impossibility of securing a uniform distribution in its application.

Still another special advantage of the incandescent electric-light bath over other sources of heat is the facility with which it can be localized. In this respect it is far superior to fomentations or any other local application of heat. By means of suitable appliances, the heat can be focused upon a small point, if desired, and affects not only the surface, but the deeper tissues. I am sure that the radiant energy of the electric light penetrates the tissues to a depth of several inches. This I have proved by actual observation, as before intimated. For deep-seated pain, as well as for the relief of hyperesthesias of the skin, I know of no remedy more valuable. Many applications of this sort have been made by myself and my colleagues, several thousand in all, and I have constant reason to be grateful for the acquisition of this therapeutic measure, as it has afforded relief to many cases which have stubbornly resisted all other therapeutic means which I have been able to employ.

*Rationale of the Effects of the Incandescent Electric Light Bath.* — The peculiar value of the electric-light bath I consider due to its efficiency as a source of radiant energy. In the Turkish bath, heat is communicated to the body chiefly by the convection of heat and air. Air, being a very poor conductor, communicates heat to the body very slowly. Absorption of heat is further hindered by the skin, an excellent non-conductor, and by the rapid evaporation of moisture upon the skin, whereby it is cooled so rapidly that it is possible for a man to enter and remain for a considerable time in an atmosphere far above the boiling point. I have several times been in a Turkish bath at 300 degrees, and suffered no inconvenience. The heat is derived from the electric light, however, by radiation, and not by convection. The skin, as well as the air, is to a large extent transparent to radiant heat, and the same is true of all the living tissues. This is evidenced by the phenomenon of transillumination. By a speculum placed in the vagina or rectum, and a suitably arranged electric light of 16 or 32 candle power placed over the abdomen, I have seen the interior of the lower trunk illuminated and made to glow with a bright red light, the red color being due to the reflection from the red corpuscles of the blood. Even the bones are transparent to light when in a living state. This is clearly shown by placing the hand between an electric light and the eye, with the fingers in close contact; the hand being placed near enough to the light, the whole fingers will be seen to

FIG. 4.—Upright Cabinet Electric-Light Bath.

FIG. 5.—Cabinet Electric-Light Bath, in Use, Head Excluded.

FIG. 6.—Horizontal Cabinet Electric-Light Bath.

be illuminated by the light, and not simply the soft parts.

It may thus be said that heat from the electric light penetrates the body just as it would penetrate any other transparent or semi-transparent medium; while the heat of the Turkish, vapor, or Russian bath is communicated to the body by convection, and slowly works its way into the body by heating the successive layers of living tissue which, although, like glass, transparent to radiant energy, also possess to a greater or less degree the non-conducting powers of glass and allied substances. It is true that non-luminous as well as luminous heat-waves are thrown off by heated bodies, the whole gamut of radiant energy in the form of heat being stated to consist of fully four octaves, more than two of which are below the red, while a whole octave is above the violet, the luminous range occupying a space only a trifle greater than what would correspond to the chord of the sixth in music. But the lower octaves of these heat-waves seem to be far less active than those included within the luminous area and above it. I do not consider that there is any specific effect obtainable from the electric light which would not be derived from any equally efficient source of radiant heat, and on this account I have preferred the term *radiant-heat bath* rather than *electric-light bath*, as the former term leaves room for the employment of any luminous source of heat which may possess properties identical with those of the electric light.

One of the great advantages of the radiant-heat or incandescent electric-light bath over the Turkish, Russian, vapor, or similar forms of bath, is the fact that the body can be subjected to the most intense heat desired without confining the patient, and without overheating the atmosphere surrounding him. This is due to the well-known fact that rays of heat pass through such transparent media as the air without heating them. This accounts for the intense cold experienced by balloonists, and by those who ascend high mountains, even in the tropics. The wood-chopper in the logging camp roasts his back before a big log fire on a cold winter's day, while Jack Frost is taking sharp nips at his nose on the other side. So the man in the incandescent-light bath, while perspiring freely, may be surrounded by an atmosphere considerably below the temperature of the body, as shown in my experiments and in the daily application of the bath.

The question of priority in the use of the electric-light bath is one in which I am not especially interested; but so far as I know, an empiric in Cincinnati was the first to make use of the arc light for therapeutic purposes. His use of the bath, however, was in connection with the "blue glass" fanaticism which spread so extensively over the country a few years ago, the electric light being substituted for sunlight, a very uncertain quantity at some seasons of the year. His use of the bath was, however, not founded on a scientific basis, and I have always regarded it as unworthy of thought or attention. About four years ago one of my colleagues, Dr. Kate Lindsay, called my attention to the personal benefit derived from the use of the heat of the electric light obtained by the application of a lamp in contact with the body and covered in such a way as to collect and retain the heat derived from it. I learned from several other persons, of similar effects obtained in the same way, and at once had constructed a variety of devices for applying heat to the different parts of the body, and also for general application.

The first bath for general application consisted of a bank of lights, between thirty and forty in number, arranged upon a frame which was hinged upon the wall in such a way that it could be raised and folded back against the wall while the patient was placed upon a suitable couch beneath it. The patient being in readiness, the frame was lowered to a position about six inches above the body of the patient, and the space about the patient enclosed by means of curtains which dropped from the edge of the frame carrying the lights.

The second form of bath which I had constructed soon after, consisted of a cabinet about eight feet in height (Figs. 4 and 5), upon the inside of which were placed between fifty and sixty incandescent lights arranged in rows, the spaces between the rows of lights being filled with silvered glass, so as to multiply the number of lights to an infinite number by reflection. The cabinet is so arranged that the whole body of the patient, including the head, can be exposed to the

influence of the light, or the head can be excluded, as in the ordinary vapor bath. The cabinet is freely ventilated, and by means of switches and a proper grouping of the lamps in wiring, the number of lights in use can be instantly and perfectly controlled. This bath, which I have had in use for more than three years, is somewhat imperfectly shown in a photograph that I herewith present. A description of this bath was published in a German medical journal by Dr. Gebhardt, who visited the Sanitarium, and personally tested the bath something more than two years ago.

The third form of bath for general application of the incandescent light, which I have had constructed more recently, consists of a cabinet lined with mirrors (Fig. 6) and containing some sixty incandescent lights, so arranged that the patient lies in a horizontal position, the lights being placed on three sides. The patient lies upon a suitable couch with rollers, which is pushed entirely within the cabinet, or only so far as to expose such portions of the body as it is desired to bring under the influence of radiant light and heat. By this plan the influence of the light can be confined to the feet and legs, or any other portion of the body up to the neck. It is only necessary to protect, by a sheet and a piece of mackintosh, any portion of the body which it is desired to exclude from the action of the bath.

I have also had constructed and have in use special appliances by means of which applications may be conveniently made to the spine, the trunk, the feet, and other parts of the body.

After nearly four years' use of the electric-light bath in a great variety of ailments, I esteem it as of greater utility than any other means of applying heat to the body, with the exception of water, the universal applicability of which gives it paramount value over all other therapeutic agents which can be employed for this purpose.

In conclusion, I wish to acknowledge my indebtedness to Professor Gomberg, of the University of Michigan, who kindly consented to devote a part of his summer vacation to the tedious chemical work required by this investigation; and to my assistants, Drs. Rand and Paulson, who assisted in the chemical work, and carried out the details of many experiments with great painstaking; and to Dr. Burleigh for careful studies of the blood in connection with the experiments.

## A SUMMARY OF THE SYMPTOMS FOUND IN FIFTY-TWO CASES OF LOCOMOTOR ATAXIA.

BY W. H. RILEY, M. D.,
Sanitarium, Battle Creek, Mich.
Member of the American Neurological Association.

THE fifty-two cases of locomotor ataxia, the most important symptoms of which are here given in the order of their relative frequency, have been examined by the writer at the Battle Creek Sanitarium, where they have applied for treatment. These patients were all males, which is quite uncommon for so large a number of cases. The percentage of females suffering with this disease is, however, usually small.

A history of syphilis was given in twenty-seven cases out of forty-one. Of the remaining fourteen cases of the forty-one, twelve had had gonorrhea, been excessive in sexual indulgence, or gave other evidence of possible exposure to syphilis. Of the remaining eleven cases of the fifty-two, syphilis was either denied or this point was not determined in the history of the case. In the cases that gave a history of syphilis, from two years to thirty years intervened between the primary venereal disease and the initial symptoms of locomotor ataxia. In most cases the initial symptom of ataxia appeared from eight years to fifteen years after syphilis had developed. In two cases the disease followed soon after a mechanical injury. A history of exposure to wet and cold was given in seven cases. One case developed immediately after an attack of typhoid fever. This last case, however, differed from cases usually seen, in that the disease was not progressive in character, and the only prominent symptoms present were well-marked ataxia in all four extremities, as well as in the muscles of speech.

The majority of these cases came from the middle and higher walks of life. In twenty-seven cases the disease first showed itself between the ages of thirty and forty years; in nineteen cases, between the ages of forty and fifty years; in four cases, between the ages of fifty and sixty

years. In one case the disease began at the age of twenty-five, and in the one case following typhoid fever, it began at the age of twenty-two years. The initial symptom, as given by patients in the history of their cases, was as follows:—

In thirty-two cases the initial symptom was pain in some part of the body, and was usually described as "rheumatic;" in three cases it was gastric crises; in three cases, laryngeal crises; in four cases, incoordination of the lower limbs. In the remaining cases the initial symptom consisted of one or more of the following: Various paresthesias in the extremities, diplopia, partial blindness, vertigo, difficulty in emptying the bladder, loss of sexual function, general feeling of weakness,—frequently without exertion,—and digestive disturbances.

The symptoms of the fifty-two cases tabulated in the order of their frequency, are as follows:—

1. Knee-jerk absent in.....47 cases
2. Severe paroxysms of pain in..47 cases
   In nineteen of these cases, severe pains were in the arm, trunk, and legs; in thirteen, in the legs alone; in twelve, in the trunk and legs; in one, in the arms alone; and in one, in the trunk alone.
3. Ataxia in locomotion, with eyes closed (47 cases examined) present in 46 cases
4. Various paresthesias, as numbness, pricking, formication, etc., present in .....45 cases
   In twenty-eight of these cases, paresthesia was confined to the lower extremities; in eighteen, to both lower and upper extremities; in two, there was paresthesia in the face as well as in the lower and upper extremities.
5. Static ataxia, with eyes closed (47 cases examined) present in..45 cases
6. Anesthesia (referring to tactile temperature, and pain sense, one or more being affected) present in....41 cases
   In twelve of these, the anesthesia was in the upper and lower extremities; in two, in the trunk and upper and lower extremities; in two, in the face and upper and lower extremities; in the remainder, in the lower extremities.
7. Girdle sensation about trunk present in.....35 cases
8. Constipation present in.....35 cases
9. Static ataxia, with eyes open (47 cases examined) present in.....34 cases
10. Ataxia in locomotion, eyes open (47 cases examined) present in...33 cases
11. Cold extremities in.....31 cases
    Loss of sexual power, partial or complete in.....31 cases
    General feeling of weariness, with diminished motor power, in....31 cases
12. Area of hyperesthesia about abdomen and lower part of trunk, with increased skin reflexes in the same area, in.....29 cases
13. Indigestion and stomach disorders in .....27 cases
    Considerable loss in weight in 27 cases
14. Myosis present in.....25 cases
    Argyll-Robertson pupil (that is, pupil contracted, responding to light but not to accommodation) in.....25 cases
15. Nervous irritability and despondency in.....24 cases
16. Accelerated pulse (85 or above) in .....22 cases
17. Skin reflexes (plantar, cremasteric, and abdominal) increased in..21 cases
    Incomplete retention of urine in .....21 cases
18. Insomnia in.....19 cases
19. Ataxia in arms in.....15 cases
20. Diplopia usually present at beginning of disease in.....14 cases
    Skin reflexes absent in.....14 cases
21. Delayed sensations in.....13 cases
    Partial incontinence of urine in .....13 cases
22. Ptosis (transient or permanent) in .....11 cases
    Attacks of sudden vertigo in..11 cases
    Partial iridoplegia in.....11 cases
23. Partial deafness in.....10 cases
24. Plantar skin reflexes absent, or very much diminished, with other skin reflexes normally present, in.....8 cases
    Gastric crises in.....8 cases
25. Tenderness along the spine in 7 cases
    Diminished faradic irritability of muscles in.....6 cases
    Diminished galvanic irritability in .....6 cases
    Unable to walk with crutches or two canes in.....6 cases
26. Rise of temperature during paroxysms of pain in.....6 cases
    Optic nerve atrophy in.....6 cases
    Laryngeal crises in.....6 cases
    Diarrhea in.....6 cases
    Pupils dilated in.....6 cases
27. Unequal pupils in.....5 cases
28. Polyesthesia in.....4 cases

29. Complete retention of urine in 3 cases
Complicated with marked muscular atrophy with the electrical reaction of degeneration in muscles in....2 cases
Tremor in hands in.....2 cases
Anesthesia in face in.....2 cases
Taste affected in.....2 cases
Area of hyperidrosis about trunk in .....2 cases
Knee-jerk present and normal in .....2 cases
30. Knee-jerk exaggerated in.....1 case
31. Hyperidrosis of both legs in..1 case
Knee-jerk present but diminished in .....1 case
Knee-jerk present in one limb and absent in the other in.....1 case
Complicated with general paresis in .....1 case
Traces of albumin in urine in..1 case
Complete incontinence of urine, 1 case
Traces of sugar in urine in...1 case

Much valuable work has been done recently, with a view to clearing up some of the difficult questions relating to this disease. I may be allowed to refer to some of these briefly in this connection.

The relative importance of the different factors which are supposed to be the cause of this disease, is a question with reference to which there is considerable difference of opinion. As nearly as can be determined by clinical observation, the factors which enter into the causation of this disease, may be briefly stated as follows: Neuropathic tendencies, syphilis, sexual excesses, exposure to wet and cold, overexertion, mechanical injuries.

Between the opinions of Erb, Möbius, Strümpell, Fournier, and others, on the one hand, who regard tabes, in the majority of cases, at least, as purely a post-syphilitic condition; and those of Leyden, Charcot, etc., on the other hand, who disregard syphilis entirely, or give it but a small place in the etiology of tabes, there are many careful observers who hold all grades of opinions between these extremes. Leyden claims that syphilis must be left out of the etiology entirely; while Charcot strongly favored a neurotic heredity, and regarded syphilis of minor etiological importance. The doctrine of the syphilitic origin of tabes is mainly due to Fournier, of Paris (in 1876), and Erb, of Heidelberg (in 1879). Previous to either of these dates, however, Virchow, Wunderlich, and Berger had already expressed themselves as believing that many cases of tabes were of syphilitic origin. In 1883, Erb declared that syphilis was the most important factor in the causation of tabes dorsalis, and that persons not previously infected with syphilis had but the slightest chance of suffering from this disease.

In the third number of his *Neurologische Beiträge*, C. J. Möbius called attention to the changes of the opinion of various authors since 1880 in regard to the etiology of tabes. He claims that the number of authors who regard syphilis as an etiological factor, are constantly increasing. While Erb, Strümpell, and other strong defenders of the syphilitic theory admit that a certain per cent. of tabetics can with certainty be excluded as not having had previous syphilitic infection, Möbius holds the most extreme views, and considers such an infection as the *sine qua non* for the development of this disease, and believes that Edinger overestimates the importance of excessive function as an etiological factor.

In 1892, Erb found that 89 per cent. of cases of tabes that he had examined, which included a large number, had previously had syphilis. Fournier states that over ninety per cent. of persons suffering from tabes have had syphilis. Out of 247 cases examined by Hirt, 90 per cent. were syphilitics. Senator gives 70 per cent., Mendel 75 per cent. Gower, of London, found in his private practice that 58 per cent. of his tabetic patients had previously had syphilis, and he thinks that, could the exact facts be obtained, two thirds would be nearer the truth. In Fraenkel's experience, the percentage was $50\frac{7}{10}$ per cent.; in Gerhardt's, 50 per cent.; in Dana's, 50 per cent. In a minute study of 212 cases, Lagondaky found 42 per cent. syphilitics. Eulenberg gives $36\frac{4}{5}$ per cent. In sixty-eight cases examined by Borgherini, he found that 32 per cent. had previously had syphilis, and 37 per cent. more had suffered from chancroid. A neuropathic taint was found in half his cases. De Werker gives 30 per cent. as syphilitics, while Panas finds that one third of his cases have previously had syphilis.

Minor shows from his statistics that tabes is much more rare in Russia among the Jews than among other Russians, which is undoubtedly due to the fact that the latter are more or less syphilitic. Magel found 46 per cent. of syphilitics

in 1403 cases. In the experience of Westphal, 14 per cent. of his tabetic patients were syphilitic. In my own experience I have found that 60 per. cent of the cases suffering from tabes dorsalis had previously had syphilis.

Grimm, in the *Berlin Medical Gesell.*, April 11, 1894, gives the result of his seven years' experience in Japan, syphilis being very prevalent in that country. Of the 13,000 cases which came to his hospital, 1020 were affected with syphilis. His expectation to find syphilitic tabes was not realized. He observed only five undoubted cases of tabes in Japan, of which only one had a history of syphilis.

Recently, Edinger has advanced a new theory as to the origin of tabes dorsalis, as well as some other diseases of the nervous system. Edinger's theory is based upon the following laws :—

1. The healthy normal activity of every organ always causes or is accompanied by certain molecular changes, which take place in the organ. The organ consequently suffers certain damages which must be repaired. When the restitution in the organ is equal to the amount of function, the organ is strengthened by functionating; but when not, it undergoes retrogressive changes.

2. A diseased, damaged, or weakened tissue soon decays, and gives place to the surrounding healthy tissue, which grows into it and takes its place.

Weigert has proved that so-called hypertrophy, proliferation, interstitial inflammation, etc., are no more than the ingrowth of healthy tissue into the diseased tissue. In the so-called gray atrophies of the central nervous system, the nerve tissue is always first diseased, after which it retrogrades, and is finally destroyed by the ingrowth of neuroglia. A degeneration of tissue must follow whenever there is a disproportion between function and restitution to such a degree that the tissue does not return to its former condition. Edinger thinks that by properly appreciating these facts, many problems may be explained which heretofore have not been fully comprehended. He therefore holds that excessive function is a common cause of tabes, as well as of other diseases of the central nervous system.

Tabes is most frequently seen in persons who overexert their legs, such as military officers, railroad men, etc., while it is seldom found in women of sedentary habits. In these cases the neuro-muscular mechanism necessary for the maintenance of the equilibrium of the body and the normal gait are excessively active, and under an uncommonly high pressure. This also explains the rare occurrence of the disease in prostitutes, notwithstanding they are frequently affected with syphilis, the etiological importance of which Edinger does not seem to underestimate.

The existence of tabetic symptoms in diabetes shows the intimate relation between diseases of the spinal cord and nutrition.

Mechanical injuries are usually considered by most writers on this subject, as one of the causes of tabes dorsalis. The cases in which the disease has followed a mechanical injury or in which there seemed to be a relation between an injury and the development of the disease, are comparatively few, and the evidence that the mechanical injury caused the disease, or was even a factor in the causation, is by no means conclusive.

Hitzig has recently analyzed sixty-six cases in which the cause of the disease was said to be traumatism. In these sixty-six cases, only ten or eleven met the requirements of sound criticism. Hitzig concludes from his study of these cases that the occasional onset of the disease in the injured side or the preponderance of the symptoms of that side are not sufficiently constant to warrant a conclusion of the traumatic origin of the disease; but, notwithstanding the great importance of previous venereal infection in most cases of tabes, Hitzig thinks that there are cases which show a distinct relation between traumatism and tabes dorsalis, and which cannot be explained in any other way.

(To be continued.)

**Sunlight as a Disinfectant.**—From a paper by Dr. Wesbrook, read at the annual meeting of the British Medical Association, we abstract the following :—

The effect of sunlight upon the cholera vibrio and other bacilli varies according to the amount of air present. Thus sunlight is a destructive agent to micro-organisms when air is freely present. When air is excluded, the growth of the organisms is stimulated by the heat, but their virulence is not increased.

# TRANSLATIONS AND ABSTRACTS

[THE articles in this department are prepared expressly for this journal.]

## ACCIDENTS TO PHARMACISTS.

THE following article, which we quote from the *California Druggist*, affords instruction for physicians as well as pharmacists: —

"The life of the pharmacist is not always free from adventure, nor his path from thorns; and even though he may gather in seven hundred per cent. profit on an emetic or a dose of salts, there are contingences in his business that the average merchant does not share. From the time when the druggist's boy burns holes in his shirt with acid in charging the soda fountain, to the haling of him before the county judge, as proprietor, for repeating a 'prescription' once too often, he must ever be on his guard against calamity.

"The time was — we know a few old fellows who remember — when the long green vial was in common use, and when the thin glass was fain to crush in the process of corking, entailing painful consequences to the fingers; when the older clerk would plan disagreeable surprises for the boy, in the educational line, utilizing for the purpose his superior knowledge of drugs like cowhage, hellebore, or capsicum pods, or setting him to work on a batch of mercurial ointment, supplying him with the freshest of lard, and highly enjoying his perspiring efforts to incorporate the coy and elusive mercury.

"However, the mill has taken the place of the mortar, and the clerk no longer makes mercurial ointment, nor powders crude drugs, and he now charges the soda fountain from a cylinder, and saves his shirts. Occasionally the accidents of the druggist partake of the comic, as when a young friend of ours, just ready one Sunday evening to go out with his best girl, was called upon to prepare a pint of 'black oil,' and, adding the acid sulphate all at once, with a vigorous shake to the other ingredients, he was transformed instantaneously from a well-dressed and scented beau to a lugubrious specimen of disappointed hope and ill-smelling clothes. A spot on the ceiling long showed the center shot of the prescription.

"A large bottle of very strong ammonia, in the hands of a clerk who was on a step-ladder, having been broken by an unlucky tap against a step, no little trouble and pain were caused by some of the contents running down the front of him, beneath his loose overalls. It was no sport for the young man, though his companions took it that way. This was in a wholesale store, and a somewhat similar accident befell another of the boys, again by the step-ladder route. In taking down a bottle of nitro-muriatic acid, some of the acid was spilled directly on the top of his head in some unaccountable way, and such a mass of capillary stickiness as resulted! The nearby water faucet and the ready resources of the chemist prevented very serious consequences. Not so easily, though, did the packer escape, when a gutta-percha bottle of hydrofluoric acid, which he was pressing into a small space in a box of goods, threw out its stopper, sending a small quantity of the acid into his eye. The incident furnished another instance of the value of the gold-medal chemist, whose promptness and skill saved the victim from blindness. A still more serious trouble came upon a poor fellow whose position as under-porter obliged him to repack Paris green. Disregarding instructions as to protecting his nose and mouth thoroughly from the dust, he inhaled enough of the poison to render him a physical wreck. For a long time he was under pension from his employers, till death came to his relief.

"Recently we were shown a rough hole in a drug-store shelf, made by the top of a bottle of peroxide of hydrogen which exploded beneath, and which would just as readily have gone through the druggist's head, had it been in the way. During the same week we saw in another store the effects of an explosion of a tube of nitrite of amyl, where thousands of particles of glass were blown into the nearby woodwork. The pharmacist was almost directly in front of and near the tube when it 'went off,' but most fortunately for his countenance, not to say eyes, he had moved his head to one side at the moment of explosion — a close call.

"Probably sulphuric acid has left its mark in the form of scars upon more druggists than has any other article in their line. We once knew a clerk in an

Eastern city who, in handling it, broke a carboy of the acid, and was pretty thoroughly saturated with the fluid. It was sheer good luck in his case that the back door opened upon the Erie Canal, into which he jumped instantly, saving his flesh, though losing his trousers. The same establishment furnished another victim a little later, who, in pouring acid from the carboy into a pitcher (the old way), splashed his face with a little acid, which struck the corner of his eye. The pain caused him to quickly jerk the carboy to an upright position, which movement threw out an additional quantity of the caustic fluid upon his arm, which was bared to the shoulder. This accident left our friend with a bad scar on his face, and caused running sores lasting many years upon his arm. Instances of similar accidents might be multiplied indefinitely, and almost every old drug-store could furnish reminiscenses of startling explosions and sudden combustions more or less serious in their effects, but which the progress of pharmaceutical knowledge is rendering less and less frequent."

**The Formation of Lactic Acid in the Stomach.**— Rosenheim and Richter (*Zeitschrift f. Clin. Med.*, 1895) dispute the claim made by Boas, that lactic fermentation of the stomach contents is a pathognomic sign of cancer, or nearly such. Richter and Rosenheim, as well as Klemperer and others, have previously shown that the lactic acid fermentation of cancer of the stomach is in no way specific in its character, and that it is often found in stomachs which are not cancerous, but in which the motor and excretory functions are impaired.

Kaufmann and Strauss have found in the stomachs of cancerous persons a long bacillus which they regard as a specific micro-organism of lactic fermentation in cancerous cases.

Richter and Rosenheim have restudied the whole subject, making a careful bacteriological investigation of the contents of the stomachs of twelve individuals, some perfectly well, others affected with cancerous affections, some with cancer of the stomach, and some with disease in other forms. In all these cases they have been able to isolate a certain number of organisms, which possess, to a greater or less degree, the power of forming lactic acid with sugar. The theory of the specific character of lactic acid fermentation of cancer is thus demolished.

Investigators have also determined that the existence of the so-called specific cancerous germs cannot be sustained, as the same germs are found in the various forms of disordered digestion, and even in some cases in which free hydrochloric acid is present.

**New Observations Respecting Parkinson's Disease.**— Paralysis agitans always presents a special contraction of the muscles. Trembling is commonly present, and muscular atrophy is sometimes found. This disease is thought by Gautier to be wrongly classed with the neuroses. Instead of being considered a functional malady of the nervous system without any appreciable lesion, it must be considered a disease of the muscles. The nervous system is involved only secondarily, the primary seat of the disease being in the muscles, the nutrition of which has been impaired. Gautier asserts that this disease is only the manifestation of a disorder pertaining to the elasticity of muscle. But this muscle has its own individual life; it nourishes itself; it has a variable composition. When at rest, the reaction is alkaline; when contracting, the reaction is distinctly acid.

Suppression of muscular elasticity results from the production of sarco-lactic acid, an acid phosphate of potash. These products accumulate in the tissues as the result of energetic, long-continued, and repeated contractions; hence any cause capable of provoking or favoring this accumulation will determine a contracture. Thus paralysis agitans is very frequent in certain persons whose professional duties are very taxing. This view of the disease suggests at once the proper mode of treatment, which consists in increasing the elimination of the irritating substances and in improving nutrition by appropriate dietary.

**Modification of the Coloring Media of Gram.**— *Annal. de l'Inst. Pasteur*, August, 1895. The principle of the modifications suggested consists in the use, as a decolorizing agent, of acetone alcohol (absolute alcohol to which has been added one third of acetone). In

the application of absolute alcohol as first employed by Gram, or the anilin oil suggested by Weigert, acetone alcohol presents the advantage of decolorizing more quickly and more surely. It does not change, and furnishes preparations which do not become brown with age. It permits of triple colorization, which is almost impossible by Weigert's method, because of the excessive insolubility of picric acid in the oil of anilin. One will employ, by preference, phenic violet, which is more easy to prepare than anilin violet, and is absolutely unalterable.

**Staining and Mounting Tube-casts.** — Dr. Byrom Bromwell describes in the *British Medical Journal*, the following method of staining and mounting tube-casts and other urinary deposits : —

"The recognition of tube-casts under such circumstances is greatly facilitated by the use of staining reagents. Picro-carmine is the stain which I chiefly use. The method which I adopt is as follows :—

"1. An ordinary conical urine glass is filled with equal parts of urine and an aqueous solution of boracic acid, and set aside until the deposit settles.

"2. The deposit is then drawn off by means of a pipette, and transferred to an ordinary test-tube in which a small quantity (half a dram is quite sufficient) of picro-carmine solution has been previously placed.

"3. The urine and staining fluids are then thoroughly mixed by inverting the test-tube two or three times, the end being closed, of course by the thumb.

"4. The test-tube containing the urine and staining fluid is then set aside to stand for twenty-four hours.

"5. The deposit, which has by that time settled at the bottom of the test-tube, is then drawn off by a fine-mouthed pipette, placed on a slide, covered, and examined under a low power.

"If any tube-casts are present, they are very easily detected by this method.

"When a cast is detected, it should be carefully brought to the center of the field, and examined with a higher power. If amyloid degeneration is suspected, methyl-violet may be used, for in some cases of waxy disease of the kidney the tube-casts give the characteristic rose-pink reaction with methyl-violet. For permanent preparation, the deposit is drawn off as in No. 5, above, and transferred to a small tube of Farrant's medium, in which it remains until the organic deposit has settled, when it is again drawn off and transferred to clear Farrant's solution, whence it is mounted in the usual manner. All organic deposits are thus stained and mounted in a perfectly clear medium. Their minute characters can be studied with the highest powers of the microscope."

**New Test for Sugar in the Urine.** — Sir George Johnson proposes, in the London *Lancet*, the following new test for sugar in the urine : —

"To equal volumes of urine and saturated aqueous solution of picric acid, half the volume of liquor potassa (p. br.) is added. An orange-red color instantly appears as a result of the incipient reducing action of *creatinin* upon the picric acid at ordinary temperature. The color is deepened by boiling, and if, after about a minute at this temperature, a bright red color appears through the test-tube when held up to the light, the urine is free from sugar. A solution containing two grains of glucose to the ounce of water is rendered so dark that no light is visible through the full diameter of the tube. It is asserted by the author that no traces of sugar exist in normal urine."

**Influence of Tea and Coffee upon Digestion.**—Schultz reports, in a recent number of the *Zeitschrift Physiol. Chem.*, 1895, a series of experiments made for the purpose of determining the influence of tea and coffee upon digestion. The results are as follows :—

1. Under the conditions of the experiment, there was ninety-four per cent. of albuminous digestion when neither tea nor coffee was added to the digesting mixture.

2. On the addition of tea, the amount of digestion was only sixty-six per cent., —nearly one-third less.

3. When coffee was added, the amount digested was still less, being only about sixty-one per cent. That the simple dilution of the fluids was not the cause was shown by the fact that when distilled water was added, there was practically no change in the amount of digestive work done.

**The Influence of Heat Applied over the Stomach upon Digestion.**— A Russian physician, M. Pouschkine (*Wratch*, October, 1895), has, by experiments upon six healthy persons, definitely determined the following facts respecting the influence of fomentations over the region of the stomach. The general result was to increase digestive activity. The total acidity and the quantity of free hydrochloric acid were increased; the amount of combined chlorin was diminished. Fermentation was diminished, while the production of peptone was increased, as was also the digestive activity of the gastric juice, together with the motor functions of the stomach.

The increased activity of digestion induced by the application of heat was found to persist for several hours, and in some instances, for several days. Practical experience long ago demonstrated the utility of the application of heat over the stomach as a means of increasing digestive activity. The writer has made use of this valuable information for more than twenty years, and with excellent success in a great number of cases.

**Local Application of Oxygen for Ulceration.**— G. Stoker recently reported to the Clinical Society of London, the cure of several cases of chronic ulcer by the local application of oxygen. The affected part was immersed in an atmosphere consisting of equal parts of oxygen and ordinary air. During the first half hour the patient experienced a prickling sensation, but this soon disappeared, and with it the intolerable pain which in some cases had previously been present. One of the cases treated was that of a young woman who had lost nearly all her hair. The oxygen was applied to the scalp by means of a rubber bonnet. At the end of six weeks, the scalp was covered with an abundant growth of hair.

**The Cold Bath in Puerperal Septicemia.**— The cold bath is contra-indicated when peritonitis, phlegmon of the broad ligaments, or phlegmasia dolens, exists. It has proved successful when grave maladies, such as measles, erysipelas, eclampsia, or bronchitis have complicated the puerperal infection. Treatment must not be delayed when high temperature and general constitutional disturbance have set in. First of all, make sure that the uterus is free from the products of conception. Then, should the temperature rise over 101° F., the bath must be used. It is often of value when the temperature is lower, and the patient already suffering from headache and hot skin. The bath should be a little over 75° F., as a rule. It is right to leave the patient in till she shivers, especially when hyperpyrexia is the most marked symptom; in other respects the same precautions are needed as in typhoid fever. Subcutaneous injections of caffein or spartein should be given before the bath when the symptoms are severe, so as to counteract the tendency to syncope.— *Macé, in Archives de Gynécologie.*

**The Influence of Ozone in the Treatment of Pulmonary Tuberculosis.**— Slétoff has recently reported some very interesting results from the use of ozone in the treatment of pulmonary invalids. The effects which he noted were as follows: When a patient enters an ozonized atmosphere, he at once begins to breathe deeper. After two or three minutes a cough is sometimes noticed as the result of the irritating effects of ozone upon the air-passages. The cough lasts only for a short time, however, and the patient notes a considerable increase in the discharge from the lungs. Expectoration also diminishes; the sleep becomes more profound and refreshing, and the appetite improves. The fever generally diminishes in the second week. The difference between the morning and the evening temperature grows less.

**Avoid Cough Mixtures in Phthisis.** —The *American Practitioner and News* says to the patient suffering from phthisis: "Never take cough mixtures if they can possibly be avoided," with which the writer heartily agrees. The patient, however, must have something to relieve his cough. What shall it be? Sipping very hot water is a remedy of great value for relieving the cough of phthisis, as well as most other forms of cough. A cough resulting from irritation is relieved by hot water, through the promotion of a secretion which moistens the irritated surfaces. Hot water also promotes expectoration, and so relieves the dry cough.

**New Method of Examining the Heart.**— Dr. Azoulay, a French physician, has proposed a new mode of examination of the heart, in which a peculiar posture of the body is combined with the usual method of auscultation. The patient lies upon the back, with the head and arms raised, and the legs raised and supported, with the knees flexed. It is claimed by Drs. Azoulay and Simon that in this position both intra- and extra-cardiac sounds of abnormal character are rendered much more distinct, and may be much more easily differentiated on account of the slowing of the heart's action, than with the patient in an upright position. The method is especially useful in the examination of children, on account of the more rapid action of the heart in this class of cases, and its great excitability.

**Diphtheria Antitoxin.**— A very interesting computation of the claims made for diphtheria antitoxin is the experience of Dr. Morrill, of the Boston Children's Hospital. During the year 1894, the hospital was closed three times on account of the prevalence of diphtheria. Early in January of the present year, nine cases of diphtheria, five of which had appeared within forty-eight hours, were found in one of the wards of the hospital. It was decided to try antitoxin as a means of protection, instead of closing the hospital, as before. Injections were at once made, and with the result that the disease was immediately arrested; and by repeating the injections every two weeks the disease was soon stamped out.

**Bismuth Paste for Orchitis.**— A thick paste consisting of subnitrate of bismuth and water is the best application for swollen testicles. It relieves the pain and the burning sensation, and the swelling rapidly subsides. It is equally useful for burns and scalds and as an application for sunburn, blistered skin, and chafing of the groin.

**Chloride of Lime for Snake Poison.**— Dr. Calmette, of Paris, recommends the injection of a solution of chlorid of lime (hypochlorid of lime) into the tissues around the bite, in cases of snake bite. The solution should be of such strength that 100 c. c. will contain 80 millimeters of chlorin.

**Influence of Electricity upon Tuberculosis.**—Professor Renzy, a German physician, has recently been experimenting upon the electric light as a curative means in pulmonary consumption. The rays of light from a powerful electrical illuminator were directed upon the chest. The result was a diminution in temperature in cases in which fever existed and also a diminution in the number of germs found in the urine. These experiments suggest the possibility that the electric-light bath may prove a valuable aid in the treatment of cases of pulmonary tuberculosis, as well as in other forms of tubercular disease more accessible to the influence of the electric light. The fact that the tissues are permeable to the influence of the electric light, is clearly proved by the experiments referred to in another article in this number. The electric-light bath has been used at the Battle Creek Sanitarium for four or five years in the treatment of many forms of chronic maladies, with great success.

**Immunity against Cholera.**—Experiments made by Pfeiffer and other investigators have shown that immunity against cholera may be established in a rabbit by inoculation with various other bacteria than the cholera bacilli, but this immunity lasts for only a short time,—scarcely more than fifteen days. In these cases also the antitoxic power of the blood is no greater than that of ordinary blood. Other investigations have shown that all immunization obtained by cultures of cholera germs exercise a more profound influence upon the system.

**Conservative Ovariotomy.**— Matthaei, a German gynecologist, maintains that in many cases in which the ovaries are removed on account of disease, a small portion of the organ may be left, so as to render fecundation possible. This method has been practiced for some years in this country by several surgeons, and apparently with good results.

**Thyroid Medication in Goiter.**— M. Marie reports a case in which a goiter as large as an orange was rapidly improved by the administration of small doses of thyroid extract (*La Presse Medicale*, November, 1895).

**Influence of Thyroidectomy upon Toxicity.**—M. Laulaine, in the *Annuaire de Therapeutique* for 1895 (p. 105), gives the results of experiments which he and others had made for the purpose of testing the influence of removal of the thyroid gland upon the bodily functions. The experiments all showed that the removal of the thyroid gland gives rise to a very great increase in urinary toxicity. The reason for this is not entirely clear, unless it be that it is a function of the thyroid gland to destroy tissue poison, a theory which rests upon very probable grounds.

**The Hot Bath in Cerebro-spinal Meningitis.**—Worroschilsky reports, in the February number of the *Therapeutique Monatshefte*, two cases of cerebro-spinal meningitis treated by the hot bath, in which most excellent results were obtained. The effect of the bath was, almost invariably, to produce sleep, reduce the temperature, and diminish pain in the head. The bath usually lasted from eight to ten minutes; temperature 104° F.

**To Cure Abnormal Sweating of the Feet.**—An eminent French authority recommends the following: Bathe the soles of the feet and the spaces between the toes every morning with a ten per cent. solution of nitrate of silver in alcohol. The application should be continued until the horny bed found upon these parts falls off.

**Splenopexy.**—Prof. Rydygier reported at the last German Congress of Surgery the cure of a case of floating spleen by making a pocket for it by separating a portion of the peritoneum, after making a transverse incision, placing the spleen in the pocket thus formed, and attaching the gastro-splenic ligament to the anterior abdominal wall.

**A Rapid Staining Method.**—Cullen (*Centr. f. allge. Path. u Patholog. Anat.*, 1895) describes a rapid method of staining fresh tissues, after hardening with formalin. By this method sections can be stained in the postmortem room within fifteen minutes of the removal of the tissue from the body. The fresh material is frozen, sections are cut and placed in a fifty per cent. watery solution of formalin for five minutes, thence into a fifty per cent. alcohol solution for three minutes, and lastly into absolute alcohol for one minute. They are then washed in water. Such sections can be stained at once and mounted in the usual way.

**A New Human Parasite.**—At a meeting of the French Society of Biology (Nov. 9, 1895), M. F. Curtis presented, through M. Giard, a description of a parasite which he has found in a subcutaneous tumor of the inguinal region. The structure of the tumor resembled that of a myxo-sarcoma. The parasite was found in two forms,—in the free form, or without a capsule, which occurred in cultivations in glycerinated potato cultures; the other was an encysted form, which was found in the living tissues. The discoverer was at first disposed to class this parasite with the yeasts, on account of its enormous size.

**Inoculated Tuberculosis.**—A lad of fifteen, shortly before his death from pulmonary phthisis; tattooed his two brothers, aged respectively ten and thirteen years, and another boy fifteen years old. The material used was India-ink rubbed up in the palm of his hand with his own saliva. The three lads came under medical observation from three to five weeks after the tattooing with a pathological condition which Mr. Jonathan Hutchinson considered the production of inoculation with tuberculosis.

# BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE AND BACTERIOLOGICAL REVIEW, from original sources.]

**The Influence of Surrounding Micro-organisms on the Cholera Vibrio.**—Sanarelli found cholera vibrios in the water supply of both Versailles and St. Cloud. The former place is practically immune from cholera, but the latter is not so to the same degree. Seeking for an explanation of the difference between the two cities in this respect, Metchnikoff obtained from some preserved choleraic dejecta, colonies identical with those of the cholera vibrio, but differing in that they grow only at temperatures beneath 30° C., give no indol reaction, and are not pathogenic to animals.

These organisms were sown on gelatin plates, but refused to grow. The plates were then exposed to the air, and a number of other organisms fell on them. Most of these had no effect upon the cholera vibrios, but some sarcinæ, and especially some yeasts, influenced their growth very markedly, so that if Metchnikoff wished to revive a vibrio that would not grow, he inoculated along with it certain other micro-organisms, and obtained the desired result. A sarcina, a torula, and a non-liquefying bacillus were isolated, all of which favor the growth of the vibrio, while there are others which certainly hinder its development.

One may conclude, therefore, that the cholera bacillus is considerably modified by the micro-organisms which surround it, and that immunity or susceptibility, in the case of cholera, depends largely upon the other microbes in the intestinal canal.

**Flies as Carriers of Germs.**— As far back as 1886, Hoffman demonstrated the presence of tubercle bacilli in the bodies of flies captured in a room occupied by a consumptive. The droppings of the flies were full of the bacilli, which were shown by experiment to be fully virulent.

Six years later Dr. A. Coppen-Jones, of Switzerland, by employing cultures of chromogenic bacteria, proved that infection can be, and actually is, carried, not only in the bodies of flies, but also by their feet. In one experiment, pieces of a culture of the bacilli prodigiosus were mixed in a mortar with some highly tuberculous sputum, in such a way that stained preparations showed these two varieties of microbes to be present in about equal numbers. Flies were allowed to light on the sputum, and, after they had flown about for a time, were permitted to walk across the surface of sterilized potatoes. In forty-eight hours numerous colonies of the bacillus prodigiosus made their appearance.

From this result we can reasonably conclude that flies are a constant source of infection. More especially is this the case in those warm countries where germ growth and decomposition are favored, and where no means whatever are employed to exclude flies from living-rooms.

**Development of Anerobic Bacteria in the Presence of Oxygen.**— M. Robert W. Kedrowski, of Moscow, reports the following results (*Zeitschr. f. Hyg. u. Infections. Skr.*, 1895):—

1. In mixed cultures, in the absence of atmospheric oxygen, anerobic bacteria cultivated with aerobic bacteria develop as well as do the last-named.

2. This development of anerobic bacteria is due to the fact that the aerobic bacteria secrete, during their development, a peculiar substance at the expense of which the anerobic bacteria live.

3. If, in these conditions, it is necessary to consider the absorption of oxygen by aerobic bacteria, the absorption of oxygen is certainly not as great as was believed by Pasteur.

4. The chemical nature of the substance secreted by the aerobic bacteria has not been determined, but by analogy it may be thought to be of the same nature as substances which favor, to a certain degree, the development of anerobic bacteria upon nutritive media, as sugar, pyro-gallor, etc.

**Hydated Cyst Containing Pneumococci.**— Gallaird (*Medecin Moderne*, April, 1895), reports that a large suppurating cyst of the liver which he opened and drained, was found to contain hooklets and pneumococci, no other microbes being present. The patient had at no time suffered from pneumonia.

**What Causes Dysentery?** — In the *Archives de Med. Experimentale*, March, 1895, the results of the investigation of one hundred and fifty-three cases of dysentery by M. Gasser are reported. He finds that the anguillula stercoralis, which was once considered an important etiological factor, has probably very little to do with the production of dysentery. The bacterium pyocyaneus is of some little importance; the bacterium coli is much more important; but the interesting facts are with regard to the ameba coli. This organism was present in about one half the acute cases, and in nearly one third of the chronic cases. Apparently there was no connection between the severity of the disease and the number of amebæ present.

Upon examining the stools of perfectly healthy individuals, Gasser discovered that amebæ were present in considerable quantities in twenty per cent. of them.

While the injection of dysenteric feces into the intestine of a cat caused ulceration, too much must not be deduced from this result, for a similar lesion was produced by the injection of sterile vegetable debris. That the ameba has some share in the causation of dysentery is very probable, but the results obtained by Gasser lead him at least to question the now-prevailing opinion that this parasite is the chief, if not exclusive, cause of this disease.

**Autoprotection.**— The number of experiments made, and the amount of space taken up nowadays by articles written upon the protective properties of fluids taken from animals which have been rendered immune, lead us to inquire what are the natural protective agents of the human body, by which the healthy organism resists the encroachments of disease. We have perhaps a partial answer in the results obtained by Buchner (*Münch Med. Woch.*). This author concludes that natural resistance depends upon —

1. The bactericidal action of certain dissolved constituents of the tissues.

2. A natural insusceptibility of the cells and tissues of the body to bacterial poisons.

3. The function of the leucocytes, which act not only as phagocytes, but also by secreting certain soluble substances, which render the body immune.

**New Milk not a Bactericide.**— The question of the bactericide properties of new milk, affirmed by certain eminent men, has been submitted by Basenan to a series of investigations in the laboratory of the University of Amsterdam. The tests were made according to the methods of Koch, the most favorable medium for the cultivation of the cholera bacillus being used. It was found that after thirty-one hours the micro-organisms had multiplied from twelve to twenty-five times. These experiments become of grave importance when we remember that new milk has been warmly recommended as a prophylactic and curative agent in times of cholera epidemic.

**Protection against Bacterium Coli Commune.**— Salvati and Gaetaus (*Ref. Med.*, May 20, 1895) have succeeded in preparing an antitoxic serum, the injection of which into animals served to protect them against the lesions caused by the bacterium coli commune. A toxic derived from a culture of the above bacterium was injected into the subjects. After each injection a rise of temperature and also a general depression of the health resulted. After several injections, the animals ceased to react, and were then proof against inoculations of bacterium coli cultures which sufficed to kill unprotected controls.

**Combating Leprosy Bacillus.**— Dr. Kitasato, a brilliant investigator of Japan, and one of the two physicians who discovered the bacterial origin of the plague, is at present engaged in carrying out a series of experiments in regard to leprosy, with the most satisfactory results. The learned doctor believes that he is on the road to discovering, not only the cause, but also the cure, of leprosy. The government of Japan, with its usual generosity, has voted a sum of money to be expended in experiments in Dr. Kitasato's laboratory.

**Infection Carried by Rats.**—The theory has been advanced and supported by creditable authority, that during the recent outbreak of the plague in China, the infection was carried through the medium of rats.

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## NEW DISCOVERIES RESPECTING THE FUNCTION OF THE INTESTINAL MUCOUS MEMBRANE.

AT a late meeting of the Biological Society of Paris, Dec. 21, 1895, Dr. Charrin and his colleague reported the results of an interesting series of experiments in which they have for some time been engaged in the laboratory of Professor Bouchard, for the purpose of obtaining the relation of the intestinal wall to various toxins.

These experiments seemed to show beyond question that the intestinal mucous membrane acts, as does the liver, in the modification or destruction of certain organic poisons. They appeared also to indicate, in general, that the action of the intestines is upon colloids and albumoses, while that of the liver is chiefly upon the alkaloids. The immense importance of this function of the intestine must be appreciated when we consider the vast number of microbes present in the fecal matters contained in the colon, which has recently been shown to amount to more than four hundred billion.

The great quantity of toxic matters produced by this immense number of microbes would certainly give rise to toxic effects, did not some protective agency exist. The experiments made by Charrin and Cassin show that the protective influence of the liver is insufficient to account for the phenomena observed in their experiments. They have found, for example, that certain poisons introduced into an isolated section of the small intestine produced no effect so long as the mucous membrane of the intestine was intact, but when the mucous membrane was injured by the application of tannin, iodine, a jet of water, or moist heat of 70° C. (158° F.), the animal was soon killed.

The practical deduction from these observations is, that a patient suffering from chronic disease, especially chronic disorders of the alimentary canal, and conditions of degeneration, slow nutrition, uric acid diathesis, etc., should be required to observe a careful dietetic regimen, with special reference to the diminution of the number of microbes in the alimentary canal, and thus to the lessening of the production of ptomains and toxins. In other words, such a patient ought to follow with great care an aseptic or antiseptic dietary, avoiding such foods as cheese, oysters, fish, and sometimes meats of all sorts.

Dr. Ferrand has recently called attention to the fact that insoluble antiseptics are of the greatest value in these cases. While it is practically impossible to obtain complete intestinal asepsis, the number of microbes can be so greatly diminished, by proper measures, that the defensive power of the system is thereby very greatly increased. Dr. Bovet, however, cautions against the prolonged use of intestinal antiseptics, since they may give rise to serious constitutional disturbances and local irritations; while Dr. Dignat (Report of the French Therapeutical Society of Paris for December, 1895, *Medical Week*) declares that intestinal antisepsis is not only useless but even dangerous in infectious diseases and in disturbances of the digestive system. These remarks, however, seem to be made with reference to calomel, a substance which, though recognized as a good intestinal antiseptic, is at the same time capable of producing much local irritation and serious disturbance of the liver, especially when used in large doses or in small doses long continued.

## BACTERIA OF THE INTESTINAL CANAL.

DRS. GILBERT AND DOMINICI recently reported to the Biological Society of Paris, the results of an interesting experiment, the purpose of which was to determine the influence of purgatives in the elimination of microbes from the alimentary canal. Half an ounce of sulphate of soda and an equal quantity of magnesium sulphate were administered to a healthy adult in the morning before breakfast. The bowels were evacuated six times during the day, the total weight of the fecal matter passed being 1.5 kilograms (3.3 pounds). The number of microbes contained in each milogram of fecal matter was found to be 272,253, and the total number evacuated during the day was 411,000,000,000. The number of microbes normally contained in the fecal matter of the person examined was found to be 67,000 per milligram, and the number eliminated in twenty-four hours, 12,000,000,000. The purgation, therefore, resulted in the discharge of thirty-four times the usual number of germs. The day following, the microbes found in the fecal matter was about double the ordinary number; and on the second day the fecal matter was normal in quantity, while the number of germs was only 1350 per milligram, or 580,500,000 in all,—less than one twentieth the normal amount, and one seven-hundredth the amount discharged on the day of purgation.

A continuous milk diet was shown to have a decided action in reducing the number of microbes in the feces. This effect, however, was not manifested until the end of the fifth day after beginning an exclusive milk diet. The action of purgatives in disinfecting the alimentary canal was prompt, but ephemeral. The only way in which intestinal asepsis can be maintained is by an aseptic dietary. The writer has found granose, zwieback, and other thoroughly sterilized farinaceous foods extremely valuable for this purpose, as they establish complete asepsis of the stomach.

The subject of intestinal asepsis is one generally recognized as of great importance. In the opinion of the writer it is one of the most important questions in the domain of rational medicine. The observations of Bouchard, Dana, and various other investigators have clearly shown that ptomains absorbed from the alimentary canal are probably the chief causes of degenerations of the liver, kidneys, the central nervous system, and other portions of the body which have so long baffled medical skill. The renowned Dujardin-Beaumetz, during the last few years of his life, constantly called the attention of the profession to the importance of an aseptic or antiseptic dietary in the treatment of a large variety of chronic disorders, especially Bright's disease, diabetes, and other maladies involving the eliminative organs. Glenard has likewise emphasized the necessity for a strict observance of asepsis in the dietary of persons suffering from dilatation of the stomach.

A dietary of milk foods and farinaceous foods is unquestionably best suited for the establishment of asepsis in the alimentary tract. The most forcible objection which can be brought against the use of flesh foods, fish, oysters, and cheese, is the readiness with which these substances undergo decomposition in the alimentary canal, and the excellent culture medium thus presented for the development of microbes and their characteristic ptomains.

## THE DIETETIC INFLUENCE OF CHLORID OF SODIUM.

THE excessive use of salt is a most common dietetic error, and yet one which, curiously, is seldom referred to by writers upon dietetics. The reason for this may be the fear of criticism in view of the experiments of Boussingault, which have been so frequently quoted in physiological

treatises that they have assumed almost equal authority with the classical experiments of Harvey upon the circulation of the blood.

The observation of many travelers, as well as many facts of common experience, contradict the conclusions of Boussingault regarding the necessity for the addition of chlorid of sodium to the food of human beings. For example, Mungo Park found the native tribes among whom he traveled living entirely without salt. The natives of Siberia make no use of salt; and in all Central Africa, salt was unknown until introduced by travelers and missionaries. The native tribes of North America, when discovered by white men, and so long as they remained in a primitive state, made no use of salt. Travelers have observed that the antelopes of South Africa do not visit the salt licks as in some other parts of the world, and it is well known that the herdsmen on our Western plains never give salt to the thousands of cattle which are there raised for the Eastern market. In certain parts of England it is the habit of farmers to give their herds no salt, yet the cattle produced in these counties have the reputation of being the finest in the world.

The conclusion drawn from these observations is that the use of chlorid of sodium by human beings is rather a matter of habit than of necessity, nature having probably exhibited the same wisdom in regard to the amount of chlorid of sodium placed in our food as with reference to the other salts required by the system.

Some years ago Leriche (*Revue Med. de la Suisse Romande*, October, 1884) showed that chlorid of sodium not only has no peptogenic action, but that when used in ordinary quantities, it diminishes the acidity of the gastric juice, this action taking place in proportion to the amount of salt. This effect of salt is attributed by Leriche to the excessive secretion of mucus which results from the ingestion of salt.

Reichmann (*Arch. f. Exper. Pathol.*, X.X. 24, p. 78), in repeating the experiments of Leriche, found that lavage of the stomach with a one or two per cent. solution of chlorid of sodium, diminished both the quantity and the acidity of the gastric juice.

Gérard observed that chlorid of sodium produced an abundant secretion of mucus in the stomach of a dog having a gastric fistula, and that the mucus thus produced neutralized the stomach fluid, which had previously been acid.

Dr. Kaus some time ago established the fact, that a solution of hydrochloric acid of 1–5000, one-fifth the strength of normal gastric juice, is sufficient to prevent the fermentative action of yeast. That fermentation is frequently present, however, notwithstanding the existence of a larger quantity of hydrochloric acid than this, has been difficult to reconcile with the fact referred to. The only reasonable conclusion which can be drawn from these observations, is, that the stomach fluid in such cases must contain a substance capable of neutralizing the disinfectant or antiseptic action of the hydrochloric acid. Dr. Bial, a German physician, and a member of the Society of Physicians of Berlin, has shown recently that such a substance does exist, and that it is chlorid of sodium. His experiments* have shown that chlorid of sodium in the proportion of four fifths, or 1 per cent. to 3.75 per cent., completely neutralizes the disinfectant action of hydrochloric acid, not only in a stomach fluid containing the normal quantity of hydrochloric acid, but also where less than the normal amount exists. In a hyperacid mixture containing .06 per cent. of free HCl, and .24 per cent. of combined chlorin, the sodium chlorid produced active fermentation in the presence of yeast, although before, with the addition of chlorid of sodium, no fermen-

*The observations of Dr. Bial were presented before the Society of Physicians at Berlin, Dec. 16, 1895, and reported in the *Medical Week* for December 27.

tation occurred. The results were the same, whether natural gastric juice or artificial mixtures were employed.

When the chlorid of sodium was so great in quantity as to react four or five per cent., the fermentation was prevented. But this was evidently due to the disinfectant action of the chlorid of sodium itself. Chlorid of sodium cannot, of course, be used as an intestinal antiseptic in such quantities as four or five per cent., which would amount to from sixty to seventy-five grams, or two to two and one-half ounces, for an ordinary meal.

It is evident from these facts that the use of chlorid of sodium as a condiment is injurious to digestion in two ways: —

1. It diminishes the amount of hydrochloric acid present in the gastric juice by provoking the secretion of a large quantity of neutralizing alkaline mucus.

2. It diminishes the disinfecting power of the hydrochloric acid which is unneutralized.

In view of these observations, it must be clearly evident that the amount of chlorid of sodium used should be reduced to a minimum. The presence of so much of it as exists in the urine and the perspiration is evidence that it is not utilized in the body in the same way as organic food substances, — in other words, it is neither changed nor retained in the body, but is rather discharged from it; and it may be easily conceived that additional injury may arise from the excessive eliminative work required of the kidneys in consequence of its excessive use. For many years the writer has found it wise to urge upon patients suffering from indigestion, the importance of lessening the quantity of salt taken with their daily food.

**Water Drinking in Typhoid Fever.** — Water drinking in typhoid fever is not a new suggestion. The importance of subjecting the tissues to an internal bath was brought prominently to the notice of the profession by M. Debove, of Paris, who was perhaps the first to systematize this mode of treatment. The treatment of this eminent physician consists almost exclusively of water drinking." "I make my patients drink," he says; and they must be kept pretty busy in attending to this rinsing process; for they are required to take from five to six quarts of water daily, which would amount to eight ounces every hour.

The writer has for many years followed the practice of having his patients drink from one half to two thirds of a glass of water hourly, when awake. It is sometimes, however, impossible to induce patients to drink a large quantity of water. In cases in which the stomach is dilated, the patient is often unable to absorb water so rapidly. In these cases the introduction of water by the rectum proves a satisfactory substitute for water drinking. Of course, if the patient subsists chiefly upon a diet of thin gruel, fruit juices, or skimmed milk, the amount of liquid thus taken may be subtracted from the quantity of water named. The important thing is to get into the system, and out of it, a sufficient amount of water to prevent the accumulation of ptomains and toxins within the body.

Copious water drinking does not weaken the heart, but, on the contrary, encourages its action, by maintaining the volume of blood. It also aids the action of the liver, the kidneys, and the skin; and by promoting evaporation from the skin, it lowers the temperature.

**The Physical Basis of Insanity.** — The old idea that insanity is a disease of the mind and not of the body has been thoroughly exploded by the labors of Bain and others, who have clearly demonstrated the physical basis of mental activity. Nevertheless, one occasionally meets physicians who still seem to hold to the old notions relating to insanity, sharing the superstitions of the common

people. At a recent meeting of the British Medical Association, Dr. Reynolds called attention to the fact that slight mental changes are present to a greater or less extent in all cases of disease. These symptoms he classifies as follows (*Medical Week*): —

"(1) Pleasurable, (2) depressed, (3) conditions of mental dulness, corresponding in actual insanity to mania, melancholia, and dementia. Mental depression is by far the most common slight emotional affection met with in bodily disease. It may, of course, be justifiable by circumstances, or it may be an unnatural depression, quite incommensurate therewith.

"Depression is notoriously frequent in abdominal diseases affecting the liver, stomach, and intestines. In jaundice, from whatever cause, depression is most intense, and in sea-sickness it is so great that the feelings during a storm at sea have been divided into three stages: first, when the traveler is afraid the ship will go down; secondly, when he does not care whether it goes down or not; and thirdly, when he is afraid it will not go down.

"Depression, with more or less hypochondriasis, is usually associated with phthisis, and it is often intense after fevers, such as rheumatism and influenza. In oxaluria and phosphaturia, whether primary or secondary, there is often much mental depression, also in the inter-paroxysmal stages of epilepsy.

"Movable kidney is often associated with hypochondriasis, and, in women, the presence of hair on the face not infrequently leads to actual melancholia.

"Feelings of terror are well marked in hydrophobia and delirium tremens, and the appearances of terror are generally seen in chorea and Grave's disease.

"Actual insanity may occur in any of the following classes of disease: (1) organic disease of the nervous system; (2) disease of the heart; (3) of the lungs (excluding phthisis); (4) of the digestive organs; (5) of the urinary and generative organs; (6) in certain general diseases, such as gout, diabetes, and myxedema; (7) germ diseases, such as tuberculosis; (8) conditions produced by various vegetable and mineral poisons; (9) traumata, including surgical operations."

In the treatment of the insane, the influence of the physical conditions above referred to, and of any others which may have a possible bearing upon the case, ought to have careful consideration. An insane man is always a sick man physically as well as mentally or morally. He is in fact, first of all, sick physically, and whatever may be done for him in the way of control and discipline, an improvement of his physical condition is a matter of the first importance. A careful regulation of the diet, the employment of massage, electricity, baths, and other rational measures of treatment, such as exercise, Swedish movements, manual and mechanical, Turkish, Russian, and electric-light baths, etc., may be advantageously employed. Whatever is good for a patient suffering from neurasthenia or nervous exhaustion, is good for an insane patient whose nervous system represents nerve exhaustion in the most extreme degree.

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**The Jukes.**—Dugdale, in his interesting study of this remarkable family, presents a most striking example of the terrible effects of heredity. He found the descendants of the public woman Margaret to number twelve hundred, and estimated from reasonably accurate data, that these twelve hundred persons, who were, almost without exception, either criminals or paupers, entailed a loss and expense to the community, within a period of seventy-five years, equal to $1,250,000.

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WHAT has become of the Keeley cure?

# REVIEWS.

*The Journal d' Hygiène.*— For nearly twenty years the French *Journal of Hygiene* has been doing a grand educational work in all French-speaking countries, in the interest of sanitary reform. The able editor, Dr. Pietra de Santa, formerly physician to the last emperor, although quite advanced in years, conducts the journal with all his old-time vigor, and, with his associate editors, gives to the readers, in each number, a feast of good things, fresh and new, in relation to sanitary progress. Dr. Pietra de Santa contributes to a recent number of this journal an able article entitled, "The Battle against Alcoholism," in which he points out the dangers of state monopoly in the manufacture and sale of alcohol, and in concluding which he quotes a very striking passage from an article by M. Belval. The following is a free translation of a few paragraphs which we very heartily endorse: —

"There is one primary and very serious consideration for protesting against state monopoly in this matter, which is, that ethylic alcohol is, by itself, dangerous. The impurities of alcohol do not alone constitute the danger of its use; and if these impurities, together with the essential oils and other ingredients added to alcohol in the manufacture of various liquors, have their particular injurious properties, perfectly pure ethylic alcohol itself exercises such a dangerous action upon the animal economy, that it must be considered as a true poison. This is a subject upon which all physiologists are agreed. It is, then, a great error to speak of 'hygienic alcohol.' There is no such thing as hygienic alcohol. Alcohol is a substance always more or less injurious, according to the condition in which it is received into the body. Under these circumstances, is it possible to sanction the idea that the state should take in hand the production of this dangerous substance, this poison, becoming a supplier of it, while well aware of the frightful ravage in the nation which will be occasioned by it?"

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*The South African Medical Journal.*— This is an interesting medical monthly already in its third volume. It is conducted with ability, presents a very creditable appearance, and discusses live questions in a lively way. The copy before us contains a number of very able articles which would do credit to any American journal published.

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ANTISEPTIC GAUZE. — Johnson & Johnson have recently issued a small monograph on the subject of gauze, which contains much of practical interest to the surgeon.

FIRST ANNUAL ANNOUNCEMENT OF THE WOMAN'S MEDICAL COLLEGE, KANSAS CITY, MO. — It is evident from the announcement of this school, that the promoters of the enterprise propose to place it upon a high level, and to give its patrons an opportunity for a thorough training in the art and science of medicine. Every institution which has for its aim the higher education of women should be encouraged, and especially a medical college for women. There is a field of usefulness for women physicians which is, as yet, occupied by only a very few. There are plenty of men physicians in this country, but the number of women physicians might be increased by a good many thousands without detriment to the profession, and with profit to women.

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HAND-BOOK OF DISEASES OF THE EYE.— By Dr. A. Eugene Fick, of the University of Zurich, translated by Dr. Albert B. Hale, of Chicago. P. Blakiston, Son & Co., Philadelphia.

This work, now in press, is announced for an early issue, and will doubtless prove to be one of the most useful of modern text-books on the eye. The translator has spent several years abroad, and is well prepared to perform the task which he has undertaken.

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SOME MINOR STUDIES IN NERVE-CELL DEGENERATION AS PRESENTED BY A CASE OF LOCALIZED CEREBRAL ATROPHY.— By Thomas P. Prout, M. D., Morris Plains, N. J.

The writer of this paper is evidently a master of the histology of the nervous system, and the paper contributes some facts of interest in this branch of pathological histology.

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A CASE OF OTITIC ABSCESS IN A DIABETIC.— By W. Cheatham, A. B., M. D., of Louisville, Ky.

An exceedingly interesting and unusual case is that reported by Dr. Cheatham, though it has, unfortunately, proved fatal.

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BULLETIN OF THE ELECTRO-THERAPEUTICAL LABORATORY OF THE UNIVERSITY OF MICHIGAN. — Register Publishing Company, Ann Arbor, Mich.

Dr. Herdman is doing a good work in the publication of this excellent little *Bulletin*.

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TUBERCULAR AFFECTIONS OF THE KNEE JOINT; PATHOLOGY AND SYMPTOMS.— By William Mackie, M. D., Milwaukee, Wis.

An able and interesting paper.

# The Battle Creek Sanitarium
# LABORATORY OF HYGIENE.

J. H. KELLOGG, M. D., Director.
GEO. W. BURLEIGH, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
A. B. OLSEN, B. S., M. D., Pathologist.
W. A. GEORGE, M. D., Chemist.

**Monthly Résumé of Work Done.**

**Toxicity from Meat-Eating.**—Experiments made by Bouchard, the writer, and others have clearly shown that the toxicity of the urine is greatly increased by the use of flesh food. The urine is a true extract of the tissues, and hence is a true measure of the proportion of poisonous elements present and circulating in the blood and other vital fluids.

By experiments made by the writer a year or two ago, the toxicity of the urine was found to be quadrupled within a week by a change from a non-flesh diet to a diet consisting chiefly of flesh. The subject of the experiment was a strong, healthy man.

Dr. Warner, physician in charge of the medical department of the Kankakee (Ill.) Insane Asylum, has suggested that a relation exists between flesh-eating and the production of venom in various poisonous animals, and calls attention to the fact that the rattlesnake, centipede, spider, and other animals whose bite produces intense poisonous effects, are flesh-eaters. He also notes the fact that the bite of a flesh-eating cat or dog is much more toxic than that of the rabbit, guinea-pig, or other herbivorous animals.

J. H. K.

## REPORT OF EXAMINATIONS OF BLOOD.

FOR DECEMBER.

| Blood Count.* | Men. | Women. | Total. |
|---|---|---|---|
| Over 5,000,000 | 5 | | 5 |
| Between 4,500,000 and 5,000,000 | 28 | 3 | 31 |
| " 4,000,000 " 4,500,000 | 15 | 25 | 40 |
| " 3,500,000 " 4,000,000 | 2 | 16 | 18 |
| " 2,000,000 " 3,500,000 | | 2 | 2 |
| Totals | 50 | 46 | 96 |

| Hemoglobin. | Men. | Women. | Total. |
|---|---|---|---|
| 100 | 19 | 4 | 23 |
| 93 | 17 | 25 | 42 |
| 85 | 9 | 7 | 16 |
| 79 | 3 | 8 | 11 |
| 73 | | 1 | 1 |
| 71 | 2 | 4 | 6 |
| 50 | | 1 | 1 |
| 28 | | 1 | 1 |
| Totals | 50 | 51 | 101 |

## GASTRIC LABORATORY REPORT.

REGULAR chemical analysis of cases for December: —

| | |
|---|---|
| Experimental | 66 |
| Regular | 56 |
| Total | 122 |

Total number of analyses made bacteriologically for the purpose of determining the number of germs present in one c.c. of stomach fluid, 48.

The following points were noted: The predominating germ; the absence or presence of gas; the behavior to gelatin; behavior of saccharin litmus gelatin; presence or absence of obligative anerobes.

Much interesting data is being collected in the new departure in the laboratory in the study of micro-organisms found in the stomach fluid. The study of the stomach fluid bacteriologically in connection with a thorough chemical analysis will throw a flood of light upon obscure cases of gastric disorders.

Already a considerable number of experimental test meals of different food elements have been given to healthy young men, to determine the presence or absence of micro-organisms. It has been found that when sterile bouillon or chicken broth is given with a sterile grain preparation as a test meal, an abundant growth of germs results. If the same person be given a sterile test meal consisting of grains alone, the growth of germs is absent.

Cases for bacteriological examination were received from the following States: Michigan, 17; Ohio, 7; Illinois, 6; Iowa, 5; Wisconsin, 3; South Dakota, 3; Connecticut, 2; Indiana, 2; Missouri, 2; Florida, 1; Idaho, 1; Minnesota, 1;

New Hampshire, 1; New York, 1; Ontario, 1; Pennsylvania, 1; Texas, 1; Washington, 1.

**Microscopical Examination of Sputum for December.**— Twenty specimens have been examined during the month, having relation to twenty cases. Tubercle bacilli were found in four cases. Cases were received from the following States: Michigan, 2; California, 1; Ontario, 1.

**Urinary Laboratory Report for December.**— Number of specimens examined, 179; number of cases, 140. Number of specimens in which albumin was found, 15; pus, 31; blood, 9; sugar, 3; bile, 2; casts, 3. There was toxicity of the urine in 3 specimens. Determinations of coefficient of nitrogen oxidation was made in 3 cases.


# Caramel-Cereal,

**for the last twenty years, has been used by the thousands of invalids who annually visit the great Sanitarium at Battle Creek, Mich.**

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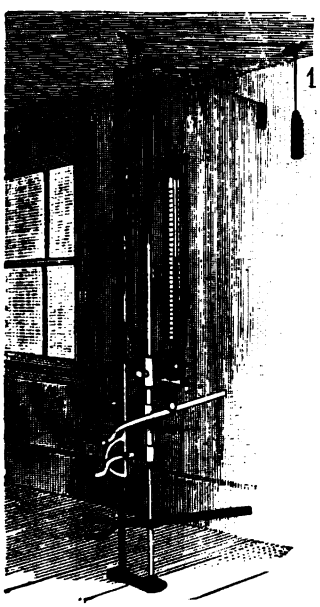

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NEW WORK ON CONSUMPTION. — A new work under the title of "Consumption: its Nature, Causes, and Prevention," over 340 pages, with illustrations, is announced as soon to be issued by William Briggs, the Toronto publisher. The prevention of this prevalent and most fatal disease is a subject of the greatest importance. Too many works on it can hardly be published. The author of this one is Edward Playter, M. D., author of Playter's "Physiology and Hygiene" (authorized for teachers), and a number of pamphlets and papers on consumption, and for twenty years editor of the *Canada Health Journal.*

He has himself made some special investigations relating to the causes of consumption, and during a practise of over a quarter of a century has given special attention to the subject. He believes, and quotes high authorities to show, that the body factor or condition — the so-called "soil" — arises directly and immediately from the decomposition of retained effete substances in the blood and tissues, the result of imperfect tissue metabolism, from a proportionately small respiratory capacity and want of oxygen; and that this factor, rather than the bacillus, should be regarded as the exciting cause of the disease, often giving virulency to the bacillus, which is also an essential factor. Ziemssen says of consumptives: "The respiration is not deep enough, and the lungs are not well expanded;" while the "outdoor," "pure air treatment," which increases the respiratory function, is universally the first and chief reliance.

The author touches upon the botany of the bacillus and its possible benign character and open-air growth (Koch to the contrary notwithstanding). He believes the disease is in a degree infectious, but that preventive measures should bear rather against the body condition as the more important and preventable cause, and quotes Sir James Clark and others in support of this.

The following indicates the heads and sub-heads under which some of the preventive measures are treated: Pure air, soil, dwellings, bed-rooms, respiratory exercises, sitting and lying outdoors, occupation, preventing "colds," words to parents, marrying, state measures, public instruction, drainage, better inspections, sanitaria, with chapters on climatology, and a short one on the climate of Northern New York, Vermont, and Canada.

---

THE SANITARIAN.— The *Sanitarian* is in its twenty-fourth year, and will continue in the future, as it has been hitherto, devoted to the promotion of the art and science of sanitation, mentally and physically, in all their relations; by the investigation, presentation, and discussion of all subjects in this large domain, as related to personal and household hygiene, domicile, soil and climate, food and drink, mental and physical culture, habit and exercise, occupation, vital statistics, sanitary organizations and laws — in short, everything promotive of, or in conflict with, health, with the purpose of rendering sanitation a popular theme of study and universally practical.

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**Bromose** is equally good for persons who cannot eat milk or cream, in consequence of the tendency of these substances to produce biliousness, constipation, headache, acidity, and other unpleasant symptoms. Those suffering in this way usually have dilated stomachs, which causes the food to be retained too long in the stomach. Milk being naturally digested in the small intestine, when it is longer retained in the stomach, undergoes decomposition, as the result of which various poisonous substances known as ptomains are formed, and by the absorption of these, biliousness and other disagreeable symptoms are produced. The retention of milk in the stomach is caused by the formation of hard curds, which are dissolved by the gastric juice with great difficulty, and often undergo decomposition before the solution is completed.

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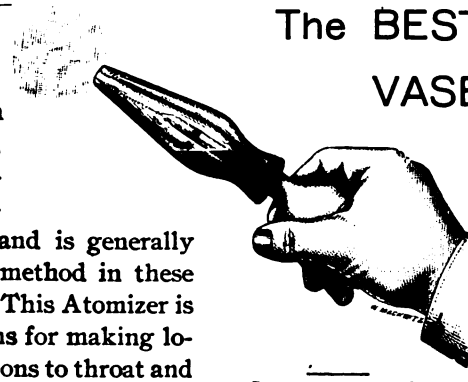

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SANITARIUM, BATTLE CREEK, MICH.

Edited by J. H. Kellogg M.D.

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THE publishers of MODERN MEDICINE will issue each month during the year 1896, under the above title, a brochure on some practical medical topic. The first number consists of a paper by Dr. J. H. Kellogg, entitled, "**What is the Matter with the American Stomach?**" which presents the results of new and interesting inquiries respecting the morbid conditions of the stomach, and their causes.

The following additional numbers are already in preparation:—

"**The Liver: Its Diseases and Modern Methods of Treatment,**" by Dujardin-Beaumetz.

"**Auto-Intoxication and Its Relations to Diet and Therapeutics,**" by Bouchard and Rogers.

"**The Importance of Intestinal Asepsis and Antisepsis in Abdominal Surgery.**"

"**Scoliosis: Its Etiology, and Rational Treatment by Massage, Swedish Movements, Gymnastics, and Electricity,**" by Dr. T. J. Hartelius, Director of the Central Institute of Gymnastics, Stockholm, Sweden.

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**MODERN MEDICINE PUBLISHING CO., - Battle Creek, Mich.**

# The Stomach:

## Its Disorders and How to Cure Them.

BY J. H. KELLOGG, M. D.,

Superintendent of the Battle Creek (Mich.) Sanitarium, Member of the British and American Associations for the Advancement of Science, the American Microscopical Society, the Society of Hygiene, of France; Author of the Home Hand-Book of Domestic Hygiene and Rational Medicine, Etc., Etc.

This book presents in a nutshell what every person ought to know about the stomach,—its functions in health, the symptoms produced by disease, and the best methods of cure.

Within the last ten or twelve years great additions have been made to our knowledge of the mysteries of digestion and the nature of the various disorders of the digestive functions included under the general term "indigestion." The stomach-tube and the application of exact methods of bacteriology and the chemical laboratory to the study of digestion and indigestion, have thrown a great flood of light upon this organ. This work is the first attempt to present in a popular form the results of these wonderful discoveries.

The special opportunities afforded the author as superintendent of the Battle Creek Sanitarium, and of the research laboratories connected with the institution, have enabled him to make a most exhaustive study of this subject; and he has undertaken to present in this little work the results of more than twenty years' investigation and experience in the treatment of the various forms of the disease commonly known as "dyspepsia."

The work is thoroughly practical, first giving a brief but very complete account of the process of digestion and the composition of food, then considering the various causes of indigestion, and afterward taking up, one by one, the leading symptoms of indigestion and the several varieties of dyspepsia, together with the appropriate treatment of each. Careful directions are given for the application of all the different remedies recommended, which include more than twenty carefully prepared Diet Lists.

The work concludes with an explanation of the new and elaborate method of investigating disorders of the stomach, in use at the Battle Creek Sanitarium, and is largely the result of researches undertaken there. The following is the list of the leading sections in the book: The Organs of Digestion; Foods; The Digestive Fluids; General View of the Digestive Process; The Maladies of the Modern Stomach; Important New Discoveries Relating to Digestion; Symptoms of Dyspepsia; The Symptomatic Treatment of Indigestion; Remedies for the Home Treatment of Dyspepsia; Quacks and Nostrums; Explanation of the Author's Graphic Mode of Representing the Results of Stomach Work, Obtainable from Examination of the Stomach Fluid by the System of Investigation Employed in the Hygienic and Research Laboratories of the Sanitarium at Battle Creek, Mich., U. S. A.

The work describes such of the various methods of treatment employed at the Battle Creek Sanitarium in the treatment of digestive disorders as can be carried out by the individual at home, giving especial attention to those which experience has shown to be the most essential and efficient.

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—AND—

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| GOING EAST. Read Down. | | | | | STATIONS. | GOING WEST. Read up. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 10 Mail Ex. | 4 L't'd Ex. | 6 Atl. Ex. | 42 Mixd Tr'n. | 2 Pt. H Pass | | 11 Mail Ex. | 1 Day Ex. | 3 E'd L't'd | 23 B. C. Pass. | 5 F'st Ex. |
| a m | p m | p m | | | | p m | p m | p m | | a m |
| 9.00 | 3.10 | 8.15 | a m | ..... | .....D. Chicago A..... | 6.45 | 1.50 | 9.10 | ..... | 7.50 |
| 11.25 | 5.05 | 10.30 | 6.00 | ..... | .....Valparaiso..... | 5.05 | 11.35 | 7.10 | ..... | 5.45 |
| p m | | | | | | | | | | |
| 1.05 | 6.30 | 12.00 | 10.05 | ..... | .....South Bend..... | 3.10 | 10.15 | 5.44 | ..... | 4.32 |
| 1.46 | 7.12 | 12.45 | 12.40 | ..... | .....Cassopolis ..... | 2.13 | 9.40 | 5.13 | ..... | 3.29 |
| 2.33 | ..... | †1.33 | 3.42 | ..... | .....Schoolcraft..... | 1.20 | ..... | ..... | ..... | ..... |
| 2.44 | 7.56 | 1.46 | 4.30 | a m | .....Vicksburg..... | 1.10 | 8.52 | ..... | p m | 2.37 |
| 3.20 | 8.36 | 2.40 | 6.20 | 7.01 | .....Battle Creek..... | 12.15 | 8.15 | 3.55 | 9.35 | 1.50 |
| 4.53 | 9.25 | 3.25 | ..... | 7.47 | .....Charlotte..... | 11.14 | 7.23 | 3.07 | 8.47 | 12.58 |
| 5.10 | 9.55 | 4.00 | ..... | 8.20 | .....Lansing..... | 10.40 | 6.53 | 2.40 | 8.00 | 12.20 |
| 6.30 | 10.45 | 5.03 | ..... | 9.30 | .....Durand..... | 9.35 | 6.05 | 1.55 | 6.50 | 11.28 |
| 7.30 | 11.17 | 5.40 | ..... | 10.05 | .....Flint..... | 8.35 | 5.35 | 1.28 | 5.47 | 10.35 |
| 8.15 | 11.50 | 6.15 | ..... | 10.48 | .....Lapeer..... | 7.49 | 5.02 | 1.00 | 5.10 | 10.01 |
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| 9.50 | 1.00 | 7.30 | ..... | 12.05 | .....Pt. H'n Tunnel..... | 6.50 | 3.50 | 11.55 | 3.50 | 8.46 |
| | p m | | | | | a m | a m | a m | p m | p m |
| 9.25 | ..... | ..... | ..... | ..... | .....Detroit..... | ..... | ..... | 10.40 | 4.05 | 8.45 |
| | a m | p m | | | | | | | | p m |
| ..... | 8.15 | 5.25 | ..... | ..... | .....Toronto..... | ..... | p m 9.20 | ..... | ..... | 1.00 |
| | p m | a m | | | | | a m | | | |
| ..... | 8.15 | 7.25 | ..... | ..... | .....Montreal ..... | ..... | 9.15 | ..... | ..... | ..... |
| | a m | p m | | | | | a m | | | |
| ... | 8.12 | 7.15 | ..... | ..... | .....Boston..... | ..... | 8.30 | ..... | ..... | ..... |
| | a m | p m | | | | | p m | a m | | p m |
| ..... | 7.50 | 4.25 | ..... | ..... | .....Susp'n Bridge..... | ..... | 10.15 | 7.05 | ..... | 2.35 |
| | a m | p m | | | | | | | | p m |
| .... | 7.00 | 5.40 | ..... | ..... | .....Buffalo..... | ..... | ..... | ..... | ..... | 1.40 |
| | p m | a m | | | | | a m | p m | | p m |
| ... | 8.53 | 8.08 | ..... | ..... | .....New York..... | ..... | 8.15 | 6.10 | ..... | 3.30 |
| | | a m | | | | | | | | p m |
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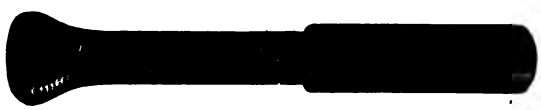

The experiments of Waldenburg, the eminent specialist in pul monary diseases at St. Petersburg, long ago demonstrated the value of modifications of the respiratory pressure as a curative means in the treatment of pulmonary disease. Special value attaches to increase of respiratory pressure for the reason that this **expands collapsed air cells,** and hence antagonizes the destructive tendency of consumption, and removes the disabling effects left behind pleurisy and pneumonia. The so-called pneumatic treatment of these maladies ha scored more triumphs than any other one method. **The most important and useful effects** of pneumatic treatment may be obtained without the aid of the expensive apparatus ordinarily employed, by the use of the expiration tube, a cut of which is herewith shown.

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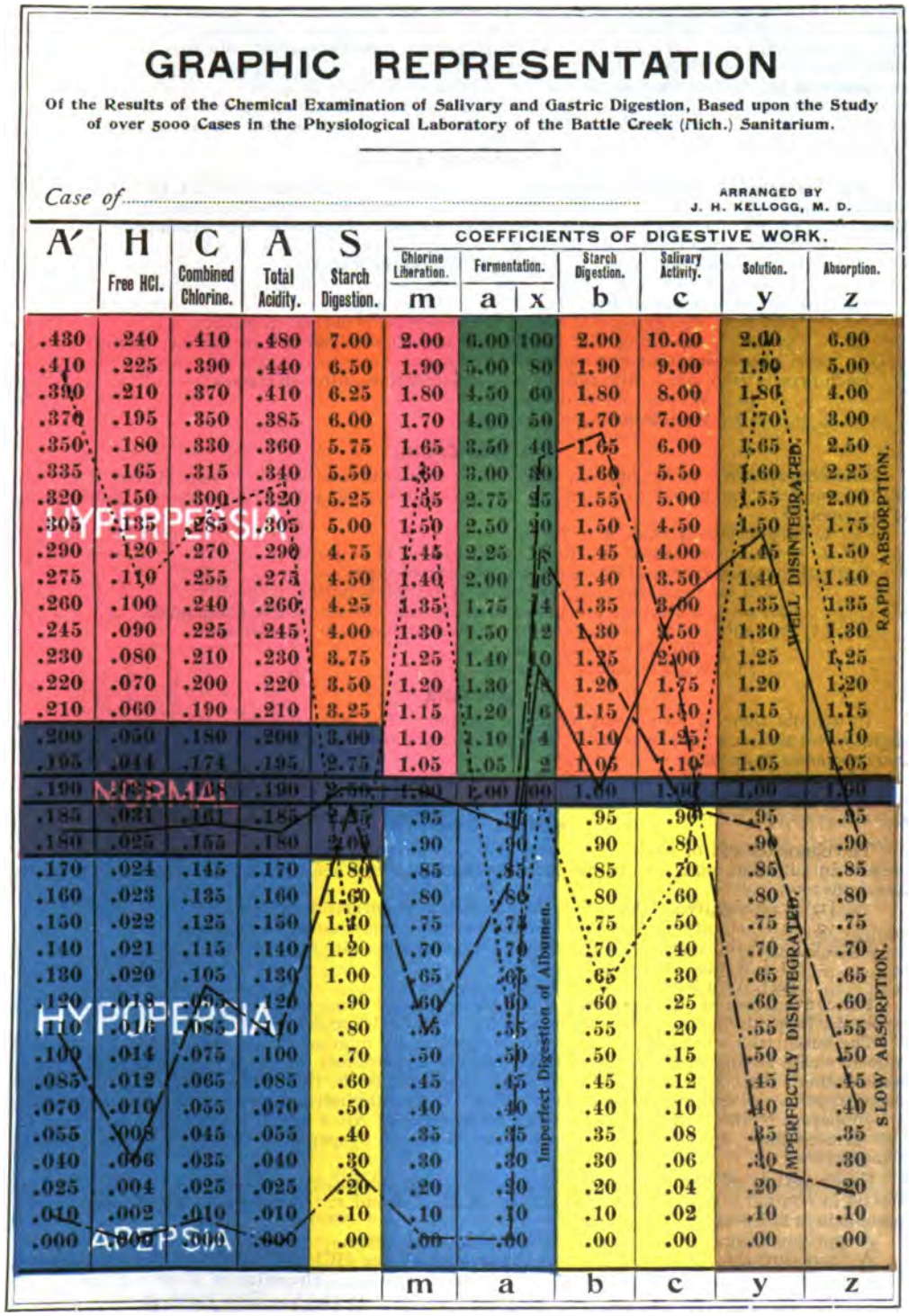
*Case of*.....

ARRANGED BY
J. H. KELLOGG, M. D.




The figures in each of the above columns relate to a particular quantity or quality of stomach work. The point at which the line starts indicates the class to

tivity of the salivary glands and of the starch-converting power of the saliva. Normally, 10 to 12 c.c. of saliva are produced in five minutes, 1 c.c. of which is capable of

## Results of Qualitative and Quantitative Determinations Relating to Salivary Digestion and the Stomach Fluid Obtained after a Test Meal.

No.....

**Mr**..... **Date**,.....189..

**Test Meal.** — Regular Breakfast, after Lavage .....
Time of Digestion:.....h.....m.....

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**Physical.** Normal.
Amount.....c.c. (40 c.c. 1⅓ oz.); Disintegration.....; Color.....
Residue.....grms. (20 grms.); Mucus.....; Odor.....

**Microscopical.**— Blood.....; Pus.....; Misc.....

**Bacteriological.**— No. of microbes per c.c. (30 c.c. = 1 oz.).....
*General Characteristics* .....
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Acid formation.....Gas production.....Liquefying.....

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Lactic Acid.....
Alcohol..... Volatile Acids..... { Acetic..... Butyric..... Formic .....
Misc.....

### QUANTITATIVE CHEMICAL DETERMINATIONS.

*DIGESTION OF ALBUMEN.*

Normal quantities.*

**Total acidity,** (A).....grms. (.180-.200 grms.) *A*†
**Calculated acidity,** (*A'*)**.....  " " " A'
**Total chlorine,** (T)..... " (.300-.330 " )
**Free HCl,** (H)..... " (.025-.050 " ) *H*
**Combined chlorine,** (C)..... " (.155-.180 " ) *C*
**Fixed chlorides,** (F)..... " (.100-.110 " ) $\frac{T-F}{T}$ =.66

*DIGESTION OF STARCH.*

**Saliva,** Reaction { Acid..... / Alkaline..... } am't in 5 m.....grms. verted .1 grms. in.....m. 1 c.c. con-

**Maltose,** (M).....grms.
**Dextrine and Soluble Starch** (D)..... "
**Fatty Acids** (from fermentation) (L)..... "
(Lactic acid.....grms. Volatile Acids.....grms.)

### COEFFICIENTS OF DIGESTIVE WORK.††

**Gastric** { **Proteids** (*a*)..... **Fermentat'n** (*x*)..

# MODERN MEDICINE

## • • AND • •

## BACTERIOLOGICAL REVIEW.

VOL. V. BATTLE CREEK, MICH., U. S. A., FEBRUARY, 1896. NO. 2.


## ORIGINAL ARTICLES.

### WHAT IS THE MATTER WITH THE AMERICAN STOMACH?[1]

NEW AND EXACT METHODS OF FINDING OUT.


BY J. H. KELLOGG, M. D.,

Battle Creek, Mich.


SOME years ago a leading English practitioner remarked to me in London, "Doctor, I suppose that in America the business of physicians is chiefly confined to the treatment of indigestion." I replied that I had heard that Americans enjoyed the unenviable reputation of being a nation of dyspeptics; but yet we did sometimes encounter other pathological states than those of indigestion. Nevertheless, as the remark of the London physician has at intervals occurred to me, I have found myself recognizing more and more distinctly the fact that, after all, the practice of medicine, outside of surgery and obstetrics, for the most part revolves about the stomach.

Bouchard has shown the important relation of ptomains developed in a dilated or atonic stomach to chronic rheumatism, to bronchitis, to anginal cardiac affections, to albuminuria and renal diseases, to pulmonary phthisis, to jaundice, and to skin diseases. He has also shown the intimate relation which exists between putrefactive and fermentative processes taking place in any part of the alimentary canal, resulting in the production of ptomains and other toxins, to puerperal fever and febricula.

M. l'Gendre has shown the relation of dilatation of the stomach to typhoid fever, and to tapeworm, lumbrici, and other intestinal parasites, great and small.

Vigoroux asserts that the great number of functional nerve disorders which are included under the general term "neurasthenia" are all of gastric origin; that neurasthenics without exception are suffering from uric acid poisoning. Excess of uric acid in the tissues is, according to Bouchard, due to an abnormal slowing of the processes of oxidation and disassimilation, which results from a toxemia arising from the absorption of the products of putrefaction and fermentation in the alimentary canal.

Dana asserts that organic changes in the central nervous system are doubtless due to the absorption of toxic substances produced by microbic processes in the alimentary canal.

Thus we see that special investigators in the etiology of disease are from all quarters pointing toward the stomach as the starting-point of the train of morbid processes which give rise, in each particular case, to a special group of morbid manifestations. Unreasonable as this may at first seem, a glance at a few simple physiological facts may serve to dissipate the apparent absurdity.

The function of a tissue or organ depends upon its structure. The structure of every cell and fiber of the body depends upon the quality and quantity of the material absorbed from the alimentary canal. A deficient supply of food weakens the structure, and lessens the energy of every organ. An excess of food overwhelms the tissues with imperfectly oxidized and toxic substances, whereby their structure is deteriorated, and their functions perverted or retarded. Food containing toxic substances produces upon the body general or specific toxic effects. The same results from the development

[1] Presented at the Annual Meeting of the Mississippi Valley Medical Association, held at Detroit, Mich., Sept. 4-6, 1895.

of toxic substances in the alimentary canal from the fermentation or putrefaction of food in the stomach and intestines. Pasteur, David, and others have shown that the mouth, the stomach, and the intestines are continually inhabited by a vast number of microbes capable of generating various acids, poisonous ptomains and toxins, varying in their physical and physiological properties, and some of them capable of producing most powerful poisonous effects. These poisons are generally produced in greater or less quantities; but thanks to the poison-destroying power of the liver and the eliminative function of the kidneys, the amount at any time circulating in the tissues of a healthy man is not sufficient to produce any more deleterious effect than that gradual deterioration of the organism by which the tissue-modifications characteristic of old age are brought about. When, however, diseased conditions of the stomach or intestines exist, these poisons may be increased to an enormous degree; for example, Bouchard has shown that if food is retained in the stomach more than five hours, the changes which take place are fermentative and putrefactive, rather than digestive. This explains the relation demonstrated by Bouchard and others between dilatation of the stomach and chronic rheumatism and the lowered vital resistance which prepares the way for tubercular disease of the lungs and other structures.

A catarrhal condition of the stomach and intestines encourages general toxemia and the development of an infinite variety of pathological conditions, by furnishing, in the masses of the mucus retained in patches upon the mucous surface, hiding-places for microbes, in which they are protected from the germicidal action of the digestive fluids. The particular form of morbid manifestation which may arise from the poison thus engendered depends upon the special properties of the poisons which may happen to be formed in the greatest abundance, and upon the susceptibility of the individual tissues. Modifications of conditions may render poisons which at one time are comparatively inert, at another time highly toxic; for example, Klebs has shown that the highly toxic poison of cholera nostras is derived from guanidin, a comparatively slightly toxic substance always present in the tissues; and Griffith has shown that the toxins of scarlet fever and diphtheria which are found in the urine of patients suffering from these diseases are derived from creatin, a poison always present in the flesh of animals, but possessed of comparatively small toxic power. These facts explain the influence of habits and conditions of life in producing susceptibility to disease, and in determining the fatality of maladies.

A perfectly healthy man is proof against germs. Cholera germs, typhoid-fever germs, and other disease-producing microbes may be swallowed with impunity by a person whose alimentary canal is intact. The gastric juice of a healthy stomach is capable of destroying every germ that lives. Bile serves the purpose of an antiseptic for the intestines, as the gastric juice does for the stomach.

One of the most important functions of the stomach seems to be the disinfection of food. The idea that microbes and putrefactive processes are essential as an aid to digestion is an error which is supported by neither physiological proof nor bacteriological facts. The normal stomach is perfectly capable of taking care of itself, provided it has a favorable opportunity, as I will attempt to show later in this paper. Nature has thus undertaken to protect the body against the destructive influence of the poisons which might develop in the alimentary canal by means of the germicidal power of the gastric juice and the bile, and has afforded a protection against both the poisons which might be actually introduced with the food, and those which might result from bacterial action in the alimentary canal by means of the poison-destroying and the poison-retaining property of the liver, as well as by the marvelous eliminative activity of the kidneys.

So long as these protective agencies are in active operation, the body retains its ability to resist the attacks of microbes, and, provided other conditions are normal, the vital resistance of the body is sufficient to cope with natural disease-producing agencies. When the protective agencies are crippled; when the stomach no longer secretes a gastric juice capable of destroying microbes; and when it becomes, by dilatation or motor insufficiency, the hold of every unclean and hateful germ, the flood-gates of disease are thrown wide open, the portals of the vital citadel are unguarded, and the excit-

ing and predisposing causes of almost every ill to which human flesh is heir are set in operation. A clinical recognition of this fact has led many a wise old physician to insist upon the supreme importance of materia alimentaria as compared with materia medica, and to recognize the paramount importance of attention to the digestive functions in the treatment of maladies of every description.

Granting the force of these considerations, it becomes a matter of grave importance that we should enquire with great solicitude, What is the matter with the American stomach? That something is the matter is evidenced not only from the facts and arguments which have been presented, but from the facts which may be gleaned from a glance through the advertising pages of any medical journal, newspaper, or popular magazine, or by an inventory of any druggist's shelves or counters. The vast predominance of medicaments intended in some way to aid the digestive organs, over all other remedies either regular or irregular, is a patent fact. Pepsin is manufactured and sold by the ton. Peptones, peptonoids, malt preparations of various kinds, diastatic and other digestive ferments of every possible form, are manufactured and sold in enormous quantities, and swallowed with avidity by the victims of digestive disorders, in the vain hope of finding relief. The questions of most practical interest in this inquiry, are —

1. What are the causes of this general failure in digestion recognizable among the adult population of the United States?

2. By what means may the functional disorders of digestion and their consequences be remedied?

This subject is altogether too large to be comprehensively treated in a single paper, but I wish to call especial attention to the results of some investigations which I have undertaken, looking toward the solution of these questions, and which I believe throw some light upon them.

From Hippocrates down to the present time, medical literature has abounded with maxims relating to eating and other matters pertaining to digestion. Some of these are recognized as the natural outgrowth of experience. Others may have only a whimsical basis, or no other foundation than the fancy of some prejudiced observer, the prestige of whose authority, however, has been sufficient to give him a certain degree of permanence. The purpose of my inquiry has been to bring to bear upon the etiological and therapeutic questions relating to indigestion, the precise methods which recent advances in the modes of physical diagnosis pertaining to the stomach have enabled us to utilize.

## NEW MODE OF INVESTIGATING DISORDERS OF DIGESTION.

Before detailing the experiments which I have made, I will briefly describe the method of investigation of the functional activities of the stomach employed by me. Some fifty years ago, Golding Bird, of Guy's Hospital, London, discovered the interesting fact that free hydrochloric acid may be separated from the gastric juice by distillation. Hayem and Winter, of Paris, developed from this fact a method of investigation of the digestive work of the stomach by which it was possible to determine not only the total amount of chlorin secreted by the stomach, but the exact relation of the different forms of chlorin,— free, combined, and fixed,— thus measuring the quantity and quality of the work done by the stomach in the digestion of proteids. Taking the work of Hayem and Winter as a basis, and adding thereto the results of the investigations of others, and the advantages of the experience gained in the careful chemical study of over five thousand stomach fluids, I have elaborated the method of studying stomach fluids which is illustrated in the blank for recording results which is shown herewith. The first page of this blank affords opportunity for recording (1) the physical and microscopical characters of the stomach fluid obtained after a test meal; (2) the colorimetric and other qualitative reactions relating to the digestive agents; (3) the digestive products and fermentation products; (4) the quantitative chemical determination relating (*a*) to digestion of albumen, (*b*) digestion of starch, (*c*) the fatty acids, and (*d*) the coefficients of the digestive work done. Of these coefficients I have established seven, as follows: —

1. Relating to the digestion of albumen.
2. Relating to the digestion of starch.
3. Relating to the activity of the saliva.
4. Coefficient of fermentation.
5. Coefficient of solution.

6. Coefficient of absorption.
7. Coefficient of chlorin liberation.

On the fourth page of the blank is shown a graphic method of recording the results obtained by these exact determinations. On pages 2 and 3 is presented a a classification of the functional disorders of digestion based upon a chemical examination of the stomach fluid obtained after a test meal in over five thousand analyses.

Considered in relation to the amount of work done, there are four general classes of indigestion: Hyperpepsia, in which there is excessive stomach work; hypopepsia, in which there is deficiency of stomach work; apepsia, in which there is no digestive activity whatever; and simple dyspepsia, in which the change in the work done by the stomach is normal, the change in the stomach work being qualitative rather than quantitative. By these studies I have been enabled to subdivide these several classes as follows: —

Hyperpepsia, into three principal classes and twelve subclasses.

Hypopepsia, into two principal classes and eight subclasses.

Apepsia, into two subclasses.

Simple dyspepsia, into four subclasses.

This makes twenty-six different varieties of indigestion, each with its individual characteristics. The study of over fifty-three hundred analyses made with painstaking accuracy accords with the methods which I have very briefly described. I have not found a single case which did not fall in one of the classes named, and have found examples of every class, although some of the classes have been represented by but a very few cases. I conclude from this fact that this classification is complete.

I will not here enter into the details of classification, as this is shown in the blank referred to, which also sets forth the particulars of the method for obtaining the several coefficients. The technique of the chemical methods employed I have given in other papers; my present purpose is simply to exhibit the fact that the method of investigation is not hypothetical nor uncertain, but has a definite and scientific foundation. One feature of the method of investigation pursued is to such an extent new, and develops facts so interesting, that I may be pardoned for presenting it at length. It has relation to the digestion of starch in the stomach.

## THE STOMACH DIGESTION OF STARCH.

The subject of the stomach digestion of starch is one which seems to have been almost wholly neglected until very recently; and even yet the majority of our text-books on physiology teach that the digestion of starch in the stomach is a matter of little or no consequence, the supposition being that the activity of the saliva ceases very soon after the food enters the stomach, in consequence of the inhibitory action of the gastric juice. Within a few years, however, the fact has been established that the active principle of the gastric juice converts starch into maltose, not only in a slightly alkaline medium, but also in the neutral or even slightly acid medium; and that, in fact, the digestion of starch proceeds more actively in a neutral medium than in one which is alkaline. Hence the alkalinity of the saliva appears to have for its purpose, not the direct increase of the activity of the ptyalin, but the prolonging of its action after it enters the stomach by the neutralization of the acidity of the gastric juice. Thus the saliva is enabled to act in the stomach with even greater rapidity than in the mouth, and may continue this action for half an hour or more after the food has been swallowed. This is amply sufficient time to enable the saliva, if a sufficient quantity of it is mixed with the food, to convert into maltose a large portion of the farinaceous constituents of the food, provided the food has been sufficiently well divided to present a surface large enough to bring the saliva promptly into contact with every particle of the digesting mass.

I have studied the salivary digestion of starch by two methods: —

1. By the establishment of a coefficient of salivary activity. This is done by a comparison of the quantity and quality of the saliva with the normal standard. The quality of the saliva is determined by the method of diastasimetry devised by Sir Wm. Roberts, an English physiologist, some years ago. The saliva is obtained by making the patient chew a quantity of paraffin gum for five minutes.

2. By the determination of the relative amounts of maltose, dextrin, and soluble starch found in the stomach fluid. The coefficient of starch digestion in the stomach is based upon a comparison of the amount of maltose with the amount

of dextrin and soluble starch. The saliva acting upon the starch in a test-tube is capable of converting eighty per cent. of it into maltose. Probably a larger per cent. than this is converted in the stomach on account of the absorption of the maltose as formed, but I have thought it best to take eighty per cent. as the standard for comparison; that is, to require that the stomach fluid, to be normal, shall show but twenty per cent. of dextrin and solubl starch to eighty per cent. of maltose.

I have been surprised at the large amount of maltose found present in the stomach fluid. In an examination of 965 stomach fluids by this method, I have found an average of 2.3 grams of maltose per 100 c. c. of stomach fluid, or 2.3 per cent. of maltose. The average amount of maltose, dextrin, and soluble starch combined, representing the total digestive work of the saliva, is nearly four grams, or four per cent. In some instances I have found as much as seven grams, or seven per cent.

An interesting fact which I have constantly noted is the much higher percentage of maltose in cases of hypopepsia as compared with hyperpepsia; for example, the average proportion of maltose in hyperpepsia is 1.9 grams per 100 c. c. of stomach fluid, and in hypopepsia 2.6, or 35 per cent. more than in hyperpepsia. The average coefficient of salivary activity is precisely the same in hyperpepsia and hypopepsia, showing clearly that the difference must be due to the difference in the acidity of the stomach contents. The averagey per cent. of maltose in twent cases of pronounced hyperpepsia was 1.8, and the coefficient .60. In eighteen cases of pronounced hypopepsia or apepsia, the per cent. of maltose was 3.7 and the coefficient .89. In other records the total amount of maltose in hypopepsia was more than double that in hyperpepsia, and the ratio of complete conversion was fifty per cent. greater. So much for the methods employed.

I will now call attention to the results of some experiments which I have made.[1] Selecting several healthy young men, by an extended series of experiments I undertook to determine some facts in relation to the hygiene of starch digestion. The above table represents the results obtained in a comparison of stomach fluids obtained after (1) water biscuit well chewed; (2) water biscuit broken, moistened with water, and swallowed without chewing; (3) raw flour; (4) raw wheat, the meal consisting of one and one-half oz. of solid substance mixed with eight oz. of water in each case.

EXPERIMENTAL RESEARCHES RELATING TO STARCH DIGESTION IN THE STOMACH.

| | Water biscuit, well chewed. 1 | Water biscuit, not chewed. 2 | Raw flour. 3 | Raw wheat. 4 |
|---|---|---|---|---|
| Total acidity (A)..... | .142 | .140 | .204 | .136 |
| Calculated acidity (A'). | .156 | .132 | .186 | .128 |
| Total chlorin (T)..... | .296 | .284 | .332 | .272 |
| Free HCl (H)..... | .050 | .028 | .056 | .052 |
| Combined chlorin (C).. | .106 | .104 | .130 | .076 |
| Fixed chlorids (F)..... | .114 | .152 | .146 | .144 |
| Maltose (M)..... | 1.088 | .272 | .000 | .000 |
| Dextrin and soluble starch (D)..... | .812 | .548 | .300 | .448 |
| COEFFICIENTS. | | | | |
| Digestion of albumen (*a*) | .82 | .97 | 1.00 | 1.00 |
| Digestion of starch (*b*).. | .71 | .42 | .00 | .00 |
| Salivary activity (*c*) .... | 1 17 | 1.11 | 1.14 | 1.37 |
| Fermentation (*x*)..... | 5 | 11 | 6 | 6 |
| Chlorin liberation (*m*).. | .80 | .70 | .85 | .71 |

Several points of interest are to be noted in the foregoing table, the first and most conspicuous of which is the fact that the saliva did not act at all upon the raw flour and raw wheat, as shown by the total absence of maltose in the cases represented in columns 3 and 4. The small amount of dextrin and soluble starch shown was perhaps already present in the raw grain, but this point I have not investigated. It is clear, however, that no sugar was produced when raw starch was taken, whereas the amount of sugar produced after the ordinary test meal was more than 1 gram in each 100 c.c. of stomach fluid; in other words, the stomach fluid contained more than one per cent. of sugar without taking into account the amount which had been absorbed.

The figures for maltose in column 2 represent a test meal in which little or no saliva was mixed with the food substance, it being swallowed without chewing. Thus it indicates very slight action of the saliva, the amount of maltose found in the stomach fluid being but a trifle more than one fourth the amount obtained after an ordinary test meal. The amount of soluble starch and dextrin

[1] A considerable portion of the following facts have been presented in another paper entitled, "Experimental Research Relating to Salivary Secretion and Digestion."

was less than half the normal amount in the case of the raw flour, and but little more in the case of the raw wheat.

Another point of interest is the increased amount of lactic acid found in the test meal taken without chewing, represented in column 2. The coefficient of fermentation which represents the number of milligrams of lactic acid (expressed in terms of HCl) found in 100 c.c. of stomach fluid, was more than double that found after the same kind of test breakfast properly masticated, represented in column 1. The results of this experiment distinctly associate fermentation with imperfect mastication and imperfect salivary digestion.

Another fact noted in a comparative study of the results of the analyses of over five thousand stomach fluids, which very strongly confirms this idea, is that starch conversion is usually complete in cases of apepsia, while lactic acid is conspicuous by its absence. In nearly all cases of apepsia which I have encountered, numbering about forty in all, the most delicate tests for lactic acid have failed to show its presence except in the most minute quantities; in most cases it was entirely absent.

Another fact of perhaps even greater interest has relation to the digestion of albumen when the wheat was eaten raw, in the form of either flour or wheat. The coefficient of proteid digestion in both cases, as is shown in columns 3 and 4, was 1.00, indicating perfect elaboration of the albuminoids. From this it appears that raw gluten, or the proteids of wheat, is digested more perfectly when taken in a raw state than when cooked, the very opposite of which we have seen to be true of starch.

The digestion of raw starch may take place in the intestines, by the action of the pancreatic juice, but cannot take place in the stomach, for the reason that the saliva has not the power to penetrate the cellulose envelope of the starch granule, and hence cannot digest raw starch. This fact coincides in a most interesting manner with the biological fact that man is by nature a frugivorous animal. In the process of ripening, the starch of fruits undergoes a hydration similar to that which takes place in cooking and in pancreatic digestion, whereby the insoluble starch is converted into soluble starch, dextrin, and sugar. This explains, also, why well-ripened fruit may be eaten raw with impunity, while unripe and farinaceous foods of all kinds require cooking. In his diet, man, like his nearest relative, the monkey, being naturally a frugivorous animal, may eat fruits in the state in which nature has provided them; but when he introduces other natural products into his bill of fare, he must adopt artificial means for securing the preparation for digestion which nature makes in the ripening process of fruits.

The coefficient of chlorin liberation ($m$) is very nearly uniform, indicating that the mastication and the cooking of food have little influence upon this digestive function.

The coefficient of salivary activity ($c$) was determined independently for each test breakfast. Its practical uniformity indicates that there was no essential change in the character or quality of the saliva to account for the differences shown by the totals in relation to the stomach digestion of starch.

(To be continued.)

## A SUMMARY OF THE SYMPTOMS FOUND IN FIFTY-TWO CASES OF LOCOMOTOR ATAXIA.

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(Concluded.)

IN the February number of the *Journal of Nervous and Mental Diseases*, 1895, Dr. Morton Prince gives a very interesting and valuable article on "Traumatism as a Cause of Locomotor Ataxia." In this article Prince describes quite fully two illustrative cases which show the liability to error in arriving at a conclusion in this matter when the statements of the patient are taken as a basis for an opinion. Dr. Prince thinks — and the point is well illustrated in the two cases which he reports — that a person may have locomotor ataxia for some months or even several years, without knowing it, or knowing that anything is specially wrong with him. Especially is this apt to be the case when the sensory symptoms are in abeyance. In view of this fact, Prince insists that the following rules must be strictly adhered to, in ex-

amining the evidence afforded by alleged individual cases : —

"1. The subject must have been proved free from tabes, either immediately before or immediately after an accident.

"2. The subject must be shown not to have been exposed to other known causes, as syphilis, for example.

"3. The trauma must have been of a nature to produce a physical or psychical impression of an appreciable degree, and not such a one as people are frequently exposed to without suffering afterward from tabes, *e. g.*, the extraction of a tooth or a mild bruise.

"4. The symptoms must have made their appearance within a reasonable time after the accident — at least within a year.

"5. The diagnosis must have been established beyond a reasonable doubt."

In this article Prince analyzes critically the evidence which is given in cases thus far reported in which traumatism was the supposed cause. He divides these cases into three classes : —

The first class, consisting of twenty-two cases, he considers inadmissible on account of the triviality of the injury, the pre-existence of syphilis, long interval between injury and onset of symptoms, doubtful diagnoses, etc.

The second class of cases, consisting of six, are those which cannot be excluded, but which from various circumstances are questionable in evidence.

The third class are those in which the disease was apparently caused by traumatism. Of these there are twelve cases. From those studied, Prince gives the following as the result of his investigation of this subject :—

"Taking all the facts above collated into consideration, it would seem that the current view that locomotor ataxia may be caused by traumatism, *per se*, irrespective of direct lesion of the cord, is not sustained by the published evidence thus far adduced. If such a relation exists, further evidence is required before it can be accepted. It would seem to be more probable, aside from mere coincidence, that when a sclerosis of the posterior column develops after a traumatism, the subject was already doomed to this condition, the process having already begun ; and that the traumatism, at most, but accelerated the development of the symptoms, and possibly of the anatomical process."

But what shall be said to be the cause of this disease ? and what are the conditions necessary for its development ? In the writer's opinion, there are two things, or conditions, necessary to the development of this disease in any individual. One of these is an organic predisposition to the disease ; that is, a neuropathic condition, — a low resistance in the nerve elements. The other essential condition is the presence in the blood and tissues of a toxin, which in a very large proportion of cases is of syphilitic origin. This toxin in the case of syphilis is constantly formed in the body after it becomes once infected, and keeps up a continuous chronic intoxication for a period of several years, until finally the vitality of the tissues is overcome, and the symptoms of tabes begin to appear.

Other infections, both acute and chronic, besides that of syphilis, have been known to cause this disease. Cases are on record in which tabes developed after infection from tubercular disease and also from leprosy. These infections, like that of syphilis, are chronic ; that is, the germs of the disease remain in the system for a long period of time, and as the result of the life and activity of these germs, ptomains are constantly formed ; and consequently the system is kept in a state of intoxication for a period of months or even years. The disease may also follow or accompany infections of acute diseases, such as diphtheria and typhus and typhoid fever. It is a well-known fact that in many cases of diphtheria there is a post-diphtheritic paralysis. This is quite frequently supposed to be due to a neuritis which is a result of the action of diphtheria toxins upon the nerve fibers. This same poison may, and does, in some cases at least, produce tabes. In my own experience I have seen one well-developed case of locomotor ataxia (tabes dorsalis, follow an attack of typhoid fever.

There is, however, an essential difference between cases of tabes resulting from chronic infection like syphilis or tuberculosis, and those of an acute infection like diphtheria, typhoid fever, etc. In the first instance the disease, in the larger number of cases at least, is progressive, which is but a natural result if the body is constantly kept intoxicated by poisons that are formed by the infec-

tion of syphilis or tuberculosis. In the second instance, that is, where the disease develops from an acute infection, it becomes, after a period at least, regressive; it does not continue to progress as in the first instance. The best reason I can give for this difference is that in these cases poisons are formed in the body only for a limited period of time. The germs of diphtheria and typhoid fever remain in the system but a few weeks, and consequently the poisoning continues only for a limited space of time.

It is as unreasonable as it is unscientific, in the light of modern pathology, to suppose that a man in the prime of life, thirty years of age for instance, should be attacked with a disease like locomotor ataxia, which constantly progresses and becomes more severe in character and wider in extent, causing the individual to stagger through life, and finally totter into the grave, except there be in the body a cause that is constantly present and active. Certainly no good reason can be given why in a man of apparently good health there should begin to be formed on the posterior columns of the spinal cord a strip of sclerosed tissue, which constantly extends its borders, unless, as said before, there exists in the body a cause that is constantly acting. To say that this might be caused by perverted action on the part of the tissues,—a sort of bad habit, as it were,—is a very poor and unsatisfactory explanation. It does not give any reason why the disease should constantly progress as it does.

Besides the infections above referred to, chemical poisons may cause this disease. It is well known that poisoning from ergot, also from lead and mercury, is frequently followed by symptoms of tabes dorsalis. Besides these, poisoning from substances formed within the body in gouty, rheumatic, and diabetic diatheses is sometimes followed by symptoms of locomotor ataxia. Locomotor ataxia may also follow pernicious anemia.

I do not believe that mechanical injury, exposure to wet or cold, overwork, or sexual excesses without infection, can be regarded as exciting causes of tabes dorsalis *per se*. None of these influences, acting alone or in conjunction, could cause a bundle of nerve fibers to degenerate, and the adjacent connective tissue to increase until a well-defined, triangular band of sclerosed tissue is formed for a greater or less distance along the posterior part of the spinal cord. That these agents have some influence in exciting the disease in many cases is granted, but their action is in lessening the vitality of the nerve elements, and preparing them for another more active agent, which I believe is always a poison from some of the sources previously mentioned. The essential thing is a toxin in the blood, which may be a ptomain, a leucomain, or a chemical poison, either organic or inorganic.

With reference to the symptomology of tabes, I believe that this is fairly well represented in a report of the symptoms found in the fifty-two cases given herewith. Many of these are seldom noticed, or only lightly touched upon, by the majority of writers upon this subject; and they are even more frequently overlooked in examinations of patients suffering with this disease.

The symptoms apt to be overlooked in connection with this disease, are an exaggeration of the skin reflexes, partial deafness, and accelerated pulse. In addition to these there is in many cases considerable loss of weight, with more or less disturbance of the digestive organs, and very frequently a relaxed condition of the abdominal muscles, allowing the stomach and bowels, and sometimes other abdominal organs, to become prolapsed and displaced. This is often a very marked condition in locomotor ataxia.

Another fact that may be mentioned in this connection is that the knee-jerk is not always absent in locomotor ataxia, as is usually supposed. Of these fifty-two cases reported, it was found absent in forty-seven. Of the five remaining cases, it was present and apparently normal in two; present, but much diminished in one; present in one limb and absent in the other, in one case; and in one case it was certainly exaggerated. There is another class of cases of so-called ataxia paraplegia in which the knee-jerk is exaggerated; but in this class there is an actual paralysis present in the lower limbs, in addition to the symptoms of locomotor ataxia, and the lesion in the cord occupies a larger and entirely different territory than in typical locomotor ataxia. The case here referred to in which the knee-jerk was exaggerated does not belong to this class. In this particular instance there was no paralysis

of the lower limbs; and a careful study of the symptoms of the case would in no way warrant putting it in this class of so-called ataxia paraplegias.

Dr. S. Weir Mitchell, of Philadelphia, has reported a case in which the knee-jerk was exaggerated, but the symptoms of ataxia were in the upper extremities entirely.

With reference to exaggeration of the skin reflexes, in my own examinations I have found this condition in many cases which I have had an opportunity of examining at an early stage of the disease. As the malady progresses, the skin reflexes diminish, and finally disappear entirely, so that in most cases of tabes in the second or third stage of the disease the skin reflexes are entirely absent. I have found this exaggeration of the skin reflexes of great diagnostic value. Cases are frequently seen where in the early stages of the disease it is somewhat difficult to make an accurate diagnosis. The symptoms are not prominent, and perhaps a diagnosis must be formed upon only a general history of the case, together with two or three symptoms. In instances of this kind, when I have found the skin reflexes exaggerated, in connection with a few other symptoms pointing to the disease, I have usually had no trouble in making a diagnosis of locomotor ataxia.

The deafness which frequently occurs in those suffering with this disease I believe to be a part of the disease proper, and that it should be considered as forming a part of the symptom-complex which characterizes the trouble. The cause of the deafness is due to a lesion of the auditory nerve in some part of its course, similar to that which affects the roots of the spinal nerves. If these cases in which deafness is present are carefully examined and the cause of the deafness sought, it will nearly always be found to be of nervous origin, at least such has been my experience.

The rapid pulse which I have frequently noticed in these cases is probably due to an irritation of the pneumogastric nerve similar to that which in the spinal nerves produce sensory symptoms.

Another unusual symptom noted in connection with the study of these fifty-two cases was, in three cases, a dilatation of the pupil instead of a contraction, as is usually the case. In those cases in which the pupils were dilated, they did not respond to the light, and only very sluggishly to accommodation. In one of the fifty-two cases there was a trace of sugar present in the urine, which has been observed a few times in other cases of this disease.

Much valuable work has been done recently with reference to the pathogenesis of tabes. The old theory which considered the primary lesion in tabes as a degeneration of the posterior columns of the spinal cord, will, in the light of recent research, hardly hold. That there is a degeneration of the nerve fibers of the posterior columns of the cord is a well-established fact; but is this primary? or is it a result of another lesion, which, at least in a casual relation, antedates it?

Rindfleisch ascribes the origin of tabes to a slightly progressive inflammation of the pia mater, which by reason of tissue continuity gradually extends to the connective tissue of the cord, and there forms an interstitial myelitis, which results in a secondary degeneration of the nerve fiber of the cord. Obersteiner and Redlich have recently advocated a modification of this idea. They have attempted to determine the exact starting-point of the degeneration. By making oblique sections of the spinal roots in the direction in which they enter the cord, they have found that, normally, the roots are slightly constricted by a circular band of connective tissue of the pia mater.

In the early stage of tabes, the roots on the spinal side of the constriction are found degenerated; the cause of this degeneration is a hyperplasia of the connective tissue, which forms the constriction. This presses on the nerve fiber, and leads to its degeneration. The reason that the nerve fibers in Lissauer's boundary zone of the spinal cord suffer so early in the disease, is that in the spinal roots these fibers are located in the periphery, and consequently suffer most from the constriction. Nageotte, in the *Société de Biologie* of Nov. 10, 1894, gives his views of the primitive lesion of tabes. He believes that the initial lesion of tabes is a perineuritis, which affects the posterior spinal roots between the spinal ganglia and the point where the roots enter the sub-arachnoid space. The perineuritis at first partakes of the nature of an embryonic process, but later is fibrous in character. Following the inflammatory process is a degeneration of

the root fibers, which extends into the posterior columns of the cord. The anterior as well as the posterior spinal nerve roots are affected by the inflammation; but as they seem to have greater resistance, the motor nerve fibers are less liable to degenerate.

Professor Lyden, as early as 1863, expressed the opinion that the lesion in tabes begins in the posterior roots, and that the degeneration in the posterior columns of the cord is secondary. The researches of Obersteiner, Redlich, and Nageotte, previously referred to, as well as those of the French neurologists, Marie and Dejerine, concur in the opinion so long ago expressed by Lyden. As to the primary seat of the lesion in tabes, Marie, however, holds that it is in the ganglia of the roots, and not in the root fibers.

It seems quite well established, therefore, that the disease begins in the posterior spinal roots, either in the nerve fiber or the ganglia, the nature of the lesion being at first inflammatory, and affecting the connective tissue, and later, degenerative, affecting the nerve fibers.

The nerve fibers which form the posterior columns of the spinal cord are but the extension of those which make up the posterior spinal roots.

A lesion affecting the fibers of the posterior spinal roots would likewise affect those of the posterior columns of the cord. A lesion of the posterior roots would interfere with the nutrition of the fibers of the posterior columns of the cord by cutting them off from their center of nutrition, which is the spinal ganglia of the posterior roots.

With reference to the treatment of this disease, space will not allow a minute description. I can make only a few general suggestions. My own practise for some time past has been to direct the treatment along two lines; viz.,—

1. To eliminate poisons that are in all probability being constantly formed.

2. To improve the general health and nutrition of the patient, special treatment being directed to the seat of the lesion.

The first of these lines of treatments, that is, the elimination of poisons from the body, I believe can be best accomplished by the free use of water internally. I usually instruct my patients to drink from five to seven pints of water daily, and to take it in small quantities and at short intervals between meals. This flushes the tissues, and keeps the poisons that may be in the body in solution, thus favoring their elimination. It also increases the activity of the eliminative organs. In many cases it is best to have the patient drink the water hot. Besides this, the use of warm baths, particularly the electric-light bath, which is usually very agreeable to these patients, is to be highly recommended. This does good, not only by the elimination of poisons, but also by relieving the distressing pains which are so troublesome in this disease. By correcting all bad habits, prohibiting the use of tobacco and alcohol, and placing the patient on an aseptic diet, the further intoxication of the body from without becomes almost impossible.

The second indications for treatment are best met by the proper use of hydrotherapy, electricity in its various forms, massage, and other manual and mechanical movements, including suspension treatment. I am satisfied from the results of the treatment in a large number of cases of this kind, that a great deal more can be done for patients suffering from this disease than is usually supposed. I do not myself lay claim to any superior wisdom or extraordinary skill in managing these cases; but I believe from my own experience that when they can be put under proper conditions,— the daily life of the patient controlled, and the treatment above indicated intelligently applied,— as much can be accomplished in this malady as in many other diseases affecting other parts, which are generally considered less intractable.

It is certainly unjust to tell a man suffering with locomotor ataxia in the first or second stage of the disease that nothing can be done for him; I have had many cases concerning which such statements had been made by physicians, and yet, after taking the course of treatment as indicated, they have materially improved, the disease being checked in its onward progress, and the patient put in a position where he could be of practical service to himself and to his friends. And this is as much or more than is done in the treatment of numerous other diseases which are not supposed to be so formidable as tabes dorsalis. I therefore wish to emphasize the fact that by the use of proper treatment much can be done for patients suffering with this disease.

## A NATURAL ABDOMINAL SUPPORTER.

BY J. H. KELLOGG, M. D.

THE labors of Glenard, Trastour, and other French investigators have brought clearly to light the exceeding prevalence of enteroptosis, or prolapse of the abdominal viscera, among civilized women, especially those who have borne children.

Many women, particularly those of feeble muscular development, and hence most women in civilized countries who are not accustomed to active muscular pursuits, suffer after confinement from a relaxed condition of the abdominal mus-

FIG. 1.

cles, and in consequence, prolapse of the bowels, stomach, and often the liver and kidneys. A great variety of nervous troubles and other disorders, such as constipation, indigestion, headache, and still more serious maladies, as Bright's disease and consumption, are the outgrowth of this prolapse of the viscera. Backache, of which so many women complain, is more commonly due to this cause than to any derangement of the pelvic organs, although displacements of the womb and ovaries and inflammation of these organs are very likely to follow displacement of the abdominal viscera.

As a precaution against this unfortunate consequence of the long-continued stretching of the abdominal muscles during pregnancy, and the inability of the undeveloped muscles to at once contract after childbirth so as to properly support the internal organs, it is important that artificial means should be employed for a time after confinement, to support the abdominal contents in place. Various abdominal supporters have been recommended for this purpose, but few have been found satisfactory. Supporters which are applied to the whole abdominal wall are unsatisfactory for the reason that the lower anterior portion of the abdomen is the only point where the support is really required.

*The Natural Abdominal Supporter.*—This instrument, well shown in the accompanying cuts, has been devised for the purpose of supporting the contents of the abdomen, when prolapsed, by a means as natural as possible.

FIG. 2.

Patients have often said to the writer, "When I am on my feet, I feel that I must hold myself up with my hands," at the same moment placing the hands across the lower abdomen and making a pressure upward. Taking a hint from this, I have prepared the supporter which is herewith shown, and which consists of two hard rubber pieces, connected by an elastic webbing, which rest against the lower abdomen, being carefully shaped so as to make a uniform pressure; and second, a set of steel springs attached to a back piece and so adjusted as to make pressure upon the hard rubber plates simultaneously in a backward and upward direction. The action of the supporter

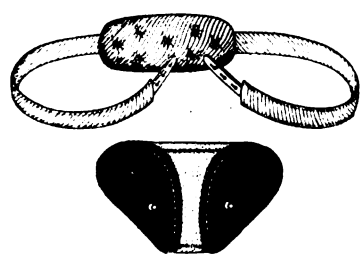

FIG. 3.

is almost a perfect imitation of the hands in lifting the prolapsed abdominal contents. After trying every form of supporter offered in the market, I have found "The Natural Abdominal Supporter" more satisfactory than any other, and have employed it in a very large number of cases. It is manufactured and sold by the Modern Medicine Co., Battle Creek, Mich.

# TRANSLATIONS AND ABSTRACTS

[THE articles in this department are prepared expressly for this journal.]

## ELECTRICITY IN MEDICINE.

DR. MORTON, in a recent paper in the New York *Medical Journal*, makes the following valuable summary of the medical uses of electricity: —

"(1) I would suggest as a definition of electrotherapeutics, in a biological sense, that it is the transformation (by the law of conservation of energies) of electric energy into the energy peculiar to vital cells.

"(2) Electricity in medicine must be regarded not as an entity, like a drug, but as having a variety of 'properties,' such as electrolysis, cataphoresis, contraction of protoplasm, etc., each of which properties may be employed, singly or combined, to combat given morbid conditions or diseases.

"(3) Of the galvanic current it may be concluded,—

"(*a*) That strong currents depress nutrition of tissues and produce structural changes leading to physiological atrophy (twenty to a hundred milliampères).

"(*b*) That mild currents stimulate nutrition and produce physiological hypertrophy (one to eight milliampères).

"(*c*) That mild galvanic currents, pulsating or alternating, produce similar effects to mild continuous currents.

"(*d*) That the negative pole is specifically indicated in that large class of cases termed chronic inflammation where newly formed fibrous tissue or exudate occurs.

"(*e*) That upon the writer's theory — already accepted by several prominent physiologists — and observations, that catabolic or destructive events in tissue uniformly present the sign of negativity,— that is to say, are at their origin electropositive (resembling the zinc of a voltaic cell), the negative pole is indicated to arrest the catabolism, the positive to augment it.

"(*f*) That the positive pole is rarely indicated, and, if so at all, upon the basis of an electrotonic effect to produce sedation of neuralgic pain in superficial nerves.

"(4) Of the faradic current it may be concluded,—

"(*a*) That its main uses are to tetanize muscle and to cause sedation of pain.

"(*b*) That the tetanizing current as now employed to treat paralyzed muscles is injurious, since it enfeebles the muscle and causes atrophic structural changes.

"(*c*) That to strengthen or properly exercise a paralyzed muscle, a slow rhythm of the faradic current — about thirty waves to the second — should be adopted.

"(*d*) That in some spastic conditions of muscles (due to paralysis of an opposing group) the strong tetanizing current may be used to advantage to overstimulate, and thus to fatigue the muscle.

"(5) Of the franklinic current, or static electricity, it may be concluded that it is an adjunct of great efficiency in practise, since —

"(*a*) It evokes the usual nerve and muscle reactions.

"(*b*) It affords a most convenient means of stimulating the peripheral distribution of the nerves in the skin, producing counter-irritating, reflex, and other afferent impression effects.

"(*c*) It has a local perturbatory action (spark).

"(*d*) It produces profound alterations in the metabolism of the individual, increasing the natural waste-products and diminishing the toxic or by-products. For this reason it is specifically indicated in cases of malnutrition, whether local or general."

**Treatment of Yellow Fever.** — Morin, a French naval physician who has had a very large experience in the treatment of yellow fever, sums up the rational treatment of the disease as follows: —

"1. Employ internal antiseptics to weaken as far as possible the infective agent.

"2. Combat as far as possible the paralyzing effect of the toxin produced by the disease upon the circulation.

"3. Stimulate, as far as possible, the absorption of the inflammatory exudates."

Morin does not employ either salicylate of soda or antipyrin, in consequence of their deleterious effects upon the kidneys. He also avoids purgatives, in consequence of their irritating effect upon the stomach and bowels. He considers quinine a good preventive remedy taken in tartaric acid lemonade.

**Lumbo-Abdominal Fluctuation.**— Professor Bard, of Lyons, has discovered that fluctuation in ascites can be readily felt by striking with one hand upon the region of the quadratus lumborum, while the other is placed successively upon different parts of the abdomen. This is considered by Professor Bard as an early sign of ascites; and when one hand is placed near the median line in front, the deceptive sensation produced by the transmission of the vibratory movement through the tissues is obviated. The patient is placed in a sitting position with the body bent slightly forward, the physician applying one hand in front, over the median line, just above the pubes, while with the other, strokes are applied over the quadratus lumborum. In some cases, also, the fluid is confined to one side of the body, as when encysted or confined by adhesions. In cases of this sort the fluctuations might not be discovered by any other means. This test may also be utilized as a means of differentiating between ovarian cysts and ascites.

**Electrical Power of the Torpedo Fish.**— D'Arsonval has recently shown that the electrical energy exhibited by the torpedo fish is capable of lighting a ten-candle incandescent lamp, the current produced when the fish is suddenly attacked being sufficient even to vaporize the filament. When measured, the current was found to have a potential energy of 1520 volts, and a quantity of 2–10 amperes.

**New Iodide of Potash for Tapeworm.**— Dr. Newington reports the discovery that a mixture consisting of hydriodate of potash thirty-six grains, iodine twelve grains, and water one ounce, is an excellent remedy for tapeworm. The mixture was given in doses of ten drops in water three times a day. In one case a tapeworm eleven yards long was passed soon after the use of the remedy was begun.

**The Infiltration Method of Local Anesthesia.**— Dr. Schleich has proposed a new method of producing local anesthesia. It is based upon the fact that the tissues, when distended with fluids, lose their sensibilities. This has been proven to be true of the bones as well as of the soft tissues. The following solutions are used by Dr. Schleich: —

STRONG SOLUTION, No. 1.

℞ Cocain muriat..... .....gr. iii.
Morph. muriat.....gr. 1–3.
Natr. chlor.....gr. iii.
Aq. dest.....ad oz. iii.
M. Sterilisat., adde sol. ac. carbolic, 5 per cent., gtt. iii.

MEDIUM-STRENGTH SOLUTION, No 2.

℞ Cocain. muriat.....gr. iss.
Morph. muriat.....gr. 1–3.
Natr. chlor.....gr. iii.
Aq. dest.....ad oz. iii.
M. Sterilisat., adde sol. ac. carbolic, 5 per cent., gtt. iii.

WEAK SOLUTION, No. 3.

℞ Cocain muriat..... .....gr. i–6.
Morph. muriat.....gr. i–12.
Natr. chlor.....gr. iii.
Aq. dest.....ad oz. iii.
M. Sterilisat., adde sol. ac. carbolic, 5 per cent., gtt. iii.

Solution No. 1, Dr. Schleich uses for operating on inflamed or hyperesthetic areas; No. 2, for most operations; No. 3, for superficial operations on nearly normal tissues.

**Castration for Hysteria.**— Charcot takes strong ground against castration for hysteria, and declares that the ovarian and menstrual disturbances met with in hysteria are due to the general disease from which the patient is suffering, and are in no way the cause of the hysterical manifestations. He states that he has never seen a case in which the removal of the ovaries in a case of hysteria would be considered a justifiable operation.

**A New Sign of Measles.**— Dr. Bolognini reports the discovery of a new symptom of measles which is observed very early in the disease, or immediately preceding the eruption, being found present at the beginning of a fever. It is sometimes seen even before the fever, when the only symptom is a slight discomfort. It occurs, sometimes, however, only after the appearance of the eruptive stage. The symptom consists in what the doctor calls the peritoneal friction. The patient is placed upon the back, with the thighs flexed, and the tips of the three middle fingers of both hands held close together. Pressure being made upon various regions of the abdomen, at first very lightly, then harder, a peculiar sensation like that of rubbing

together two rough surfaces is felt. The sensation is not felt everywhere, only at certain points. It also seems to be somewhat transient, disappearing after being excited by a series of rapidly repeated pressures. Dr. Bolognini believes the symptom to be due to an eruption of the peritoneum. In two or three cases he observed the friction before the cutaneous eruption. This observation seems to indicate that an eruption of the peritoneum occurs in measles before the characteristic eruption of the skin.

**Insomnia.**— The London *Lancet* presents the following thoughts respecting insomnia: —

"Insomnia is really a mere symptom, and will no more be treated *per se* by the intelligent practitioner than the eruption of an infectious fever or the diarrhea of typhoid fever. The great duty of the medical man is to trace it to its causes and its associations, and to deal with these. If it follows influenza, it must be regarded, like all the other *sequelæ* of that protean disease, with some patience, but with much conviction that it will yield, sooner or later, to sound treatment. A very important point is to ascertain whether the insomnia is attended with pyrexia or otherwise, for of all means for producing restlessness, and marring the night's repose an increase of two or three degrees in the temperature is among the most effective. Apart from general pyrexia, it is well to note all local peculiarities of heat, whether in the direction of excess or defect — cold feet, a hot bed, etc. — and to deal with them accordingly. It is, of course, equally important to ascertain any error of function that can reasonably be associated with such a symptom. Such errors may frequently be found in the gastric or renal or hepatic functions, and their removal will quickly alter the whole complexion of the patient's life both by night and by day."

**Galvanism to the Pneumogastric in the Vomiting of Pregnancy.** — M. Champetier reports five cases in which the irrepressible vomiting of pregnancy was relieved by the application of galvanism. The positive pole is placed just above the right clavicle, between the two portions of the sterno-cleido-mastoid muscle, the negative electrode being placed at the umbilicus. The strength of current employed was eight to ten milliamperes, the length of application from fifteen to thirty minutes. This method is an old one, but latterly seems to have been rather lost sight of.

**For Inflammatory Condition of the Skin, Attended by Itching.**— To five parts each of French chalk and powdered starch add two parts of glycerin and ten of Goulard water. In using, shake the bottle thoroughly, pour out a small quantity, add twice its volume of water, mix well, and apply to the affected parts with a brush. Leave the parts exposed until the solution is dried, when the surface will be found covered with a thin coating of powder, which is cooling and antiseptic in its action, and relieves itching. If the solution is found at all irritating, replace one half the lead water by at least one half of one per cent. of a boracic acid solution. This preparation should be used only in conditions in which there is a poisonous moisture discharged, and in which irritation and itching exist. It is especially useful in chronic eczema, eczema of the anal region, lichen, and psoriasis.

**Retention of Fetus for Fifteen Years.**— M. Folet, of Lisle, recently reported to the Academy of Medicine, of Paris, the details of a case of twin-tubal pregnancy, in which the fetus was removed after it had been retained for fully fifteen years. The only inconvenience the patient suffered was from a recent attack of peritonitis, resulting in very extensive adhesions.

**Cold-Bath Treatment for Typhoid Fever.**— The *American Medico-Surgical Bulletin* publishes the following excellent abstract of an article with the above title, which has recently appeared in the *British Medical Journal*: —

"Although the cold-bath treatment of typhoid is identified with Brandt, of Stettin, it really originated with Dr. Currie, of Liverpool, in 1787. After his death, it lapsed until it was revived by Brandt in 1861. The indications for

the bath are a continued temperature of 102° to 104° F. for several days, with marked evening rise, and no local lesion, like pneumonia, to account for it. The temperature should be taken half an hour before the bath, and regularly every three hours. Whenever the rectal temperature rises to 102.2° F., the bath should be repeated. In some cases a tepid bath at 87° or 90° F. for thirty minutes is better borne; in others, a bath at 66° or 78° F. for fifteen minutes. When the temperature no longer rises to 102.2° F., but still remains above normal, a warm or tepid bath for fifteen to thirty minutes night and morning is beneficial and grateful to the patient.

"The author has compiled from various sources the following code of rules: —

"1. A temperature of 102.2° in the rectum calls for a bath, and it must not, as a rule, be permitted to rise higher without giving the bath, unless the patient is in a sound sleep.

"2. The bath, long enough for the patient to lie at full length in, is brought close to the bedside, and the patient carefully lifted in and out in the horizontal posture.

"3. Half an ounce or an ounce of old pale brandy in two or three ounces of soda or aërated lime-water to be given first (in case of adult).

"4. The patient must always pass water before being put in the bath.

"5. The patient is to be immersed up to the neck; the head to be constantly sponged; and the chest and extremities, not abdomen, to be gently rubbed by an attendant.

"6. The first bath should be given at 90° or 85° F., and cooled down by adding cold water to 75° or 70°. If the patient bears it well, subsequent baths may be given at 80°, and cooled down to 70°. The cold water is poured over the patient's head and chest.

"7. Average duration of bath should be ten minutes; some say until patient begins to shiver; but if he begins to feel cold, or gets uneasy, the bath must be cut short. Where a patient is nervous, or bears the cool baths badly, he must be kept in tepid ones at 87° F., for fifteen, twenty, or thirty minutes, the more prolonged immersion producing the desired effect.

"8. Lift the patient carefully on to a couple of large, soft bath-towels laid over a mackintosh sheet, and rub him dry briskly, except the abdomen, which dry gently; envelop him in a warm blanket, and put him in bed, covering lightly, and give a cup of warm coffee and milk or peptonized cocoa and milk.

"9. Half an hour afterward take the temperature, in the rectum preferably, when it should be two or three degrees lower.

"10. Take the temperature every three hours; and as soon as it again rises to 102.2° F., repeat the bath, unless he is sleeping, when, as a rule, he must not be disturbed, even if the temperature rise to 104°, but the bath deferred till he awakes.

"11. Usually a bath is indicated every six hours. Sometimes, however, during the fastigium the pyrexia is so obstinate and uncontrollable as to call for a bath every two or three hours.

"12. During the night, baths are seldom called for except by an extremely high temperature.

"13. In case the bath lowers the temperature only one degree or less, or only for a very short interval, it becomes necessary to lower its temperature to 66° (cool bath) or even 45° (cold), and lumps of ice may be put in the bath to cool it down with perfect safety. In Strümpell's experience, baths below 73° F. are seldom needed. He regards 80° to 85° F. as the average.

"14. If intestinal hemorrhage occurs, baths must be discontinued.

"The advantages of the bath treatment are: (1) Diminution of fever and calming of the nervous system; (2) disappearance of headache, stupor, and delirium; (3) irritability of the gastro-intestinal mucous membrane more or less relieved with less thirst, vomiting, and diarrhea; (4) improvement of the pulse; (5) diminished dehydration of tissue and lessened danger of bed-sores; (6) diuretic action on the kidneys; (7) reduction by fifty per cent. of mortality. The objections to the treatment are: Expense, public prejudice, nervous dread of patients, and increased frequency of relapse. The contra-indications are: Peritonitis, perforation, hemorrhage, and advanced cardiac weakness. Broadbent does not think albuminuria or pulmonary complications prohibitive."

# BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE AND BACTERIOLOGICAL REVIEW, from original sources.]

## OYSTERS AND BACTERIA.

DR. FOOTE, demonstrator of bacteriology in the medical department of Yale University, made, a few months ago, some interesting studies of the oyster with special reference to its relation to the typhoid bacillus. That there is danger of contracting typhoid fever through the use of raw oysters is very clear from the following facts condensed from Dr. Foote's paper: —

Freytag found that the typhoid bacillus will live in a concentrated salt solution for five months.

Giaxa detected typhoid bacilli in unsterilized sea-water nine days after infection, and in sterilized water twenty-five days after infection. Dr. Foote's experiments gave similar results. He observed that a low temperature preserved the life of the bacillus, the vitality of which was not injured by freezing.

Examination of the stomach and liver of the oyster showed them frequently to contain living microbes. One of the most interesting experiments made by Dr. Foote consisted in the inoculation of the oyster with typhoid bacilli, and the subsequent examination of the oyster juice and parts of the oyster at various times, for the purpose of determining how long the typhoid bacillus will retain its vitality in the oyster itself. As the result of these experiments, it was shown that the typhoid bacillus lives readily in oyster juice, and possibly multiplies, and that it penetrates the stomach. Many bacilli were found in the oyster juice and in the stomach of the oyster a month after infection, from which it appears that typhoid bacilli may live even longer in the oyster than in the water which surrounds it, from which they usually disappear within three weeks when new infection does not occur. The oyster is therefore shown to be not only a carrier of typhoid bacilli, but a means of preserving them, so that the use of raw oysters would appear to be really more dangerous than the use of water which is more or less liable to pollution.

**Bacteria in Railroad Cars.** — An examination of the dust of railroad cars made in Germany under the directions of the Imperial Board of Health, showed in fourth-class cars more than twelve thousand germs per meter, and in first-class cars about one fifth this number. Some of the animals inoculated with the dust died of tuberculosis, showing the presence of this germ with the other miscellaneous microbes, of which railroad carriages, as at present managed, furnish a very large assortment.

**Tubercular Infection through Milk.** — An investigation of the milk supply of Boston, made under the supervision of the Massachusetts Agricultural Experiment Station at Forest Hills, showed tubercular bacilli in the milk of twelve out of thirty-six animals furnishing milk for distribution in the city of Boston. It is interesting to note that in none of these cases was there any infection of the udder. Tuberculosis was communicated to guinea-pigs by the milk from six of these cows. Experiments made with different animals showed that four per cent. of rabbits, fifty per cent. of guinea-pigs, and thirty per cent. of calves were infected by milk from the tuberculous animals. Of thirty-three samples collected from various sources in Boston to test the general milk supply, tubercle bacilli were found in one sample, which communicated the disease to rabbits inoculated with it.

**Immunity against Cholera.** — We are sorry to note that M. Haffkine has been compelled to leave his work in India on account of failing health. This indefatigable worker has done much to establish the feasibility of protection against cholera by inoculation. Although Ferrán and the Klemperers had previously pioneered the way toward the splendid results which have been obtained by M. Haffkine, it required the untiring energy and perseverance of the last-named bacteriologist to demonstrate the entire feasibility and the great practical value of anti-choleraic inoculations. Ferrán reduced the mortality in cholera from thirty-three to three in one thousand, and the infections, from seventy-six to twelve in one thousand, during the great epidemic in Spain. Haffkine

has in some cases succeeded in actually obliterating the disease by inoculations.

**Osteomyelitis Caused by the Bacterium Coli Communis.** — To what extent the bacterium coli communis is responsible for osteomyelitis we are not prepared to state definitely. Akerman, writing in the *Arch. de Méd. Expérimentale*, gives the results obtained by him in a series of experimental investigations. Bacterium coli communis, injected into the veins of young rabbits, produced inflammatory lesions of the osseous system, resembling in many of their characteristics those produced by the organisms of suppuration. Infiltrations of embryonic cells occur in the soft parts of the bone. In a later stage softened foci and circumscribed abscesses are formed beneath the periosteum and in the interior of the bone. These lesions are especially common in the neighborhood of the epiphyses, and are always multiple. Occasionally the process is more chronic, and portions of bone undergo slow necrosis, with a resulting sequestrum. This author is convinced that many cases of osteomyelitis are due to infection by the bacterium coli communis.

**Effects of High Pressure on Germs.** — Dr. Roger, a French physiologist, has been making a series of experiments to determine the influence of pressure upon bacterial life. He found that a pressure of 550 lbs. had no influence upon pus-producing germs, germs of erysipelas, bacillus coli, and several other pathogenic organisms. A pressure of 3000 atmospheres had no influence upon the bacillus coli, but slightly attenuated the anthrax bacillus.

**Bactericidal Properties of Sea-waters.** — Pina (*British Medical Journal*) has shown: —

1. That sea-water begins to exhibit an attenuating action upon microbes after three hours.

2. That this action continues for several weeks, at the end of which time the virulence of the microbes is entirely destroyed, but that they continue to grow.

3. This property of sea-water is possessed by water from all depths.

4. The greater the distance from the shore, the smaller the number of microbes to be found in the water.

5. Water used for street sprinkling should be taken from a safe source, so as to make sure that it is free from pathogenic germs.

**The Nature of Immunity.** — Mesnil, in experiments with fish, has found that germs introduced into their abdominal cavity are taken up by certain cells in the interior of which they are destroyed. In the case of perch, no eosinophil cells were found, from which it is argued that the microbes were not destroyed by the peculiar products secreted by the eosinophil cells.

Dr. J. W. Mc Laughlin, of Austin, Texas, has discovered a micrococcus which is peculiar to dengue. The coccus discovered is quite unique. As seen under the microscope, the cocci are arranged in filaments consisting of segments. Each segment consists of a large coccus surrounded by several smaller ones. The cocci are encapsulated, and are found in the blood, in which they invade the red corpuscles.

**The Time and Temperature Required to Destroy the Micro-organisms of Milk.** — Dr. J. Forster, of Amsterdam, has prepared the following table as the result of a large number of experiments: —

| | | | |
|---|---|---|---|
| 131° | F. | for | 4 hours. |
| 140° | " | " | 1 hour. |
| 149° | " | " | 15 minutes. |
| 158° | " | " | 10 " |
| 176° | " | " | 5 " |
| 194° | " | " | 2 " |
| 203° | " | " | 1 minute. |

**The Diphtheria Bacillus under a Low Temperature.** — Experiments made by Abel have shown that the diphtheria bacillus is capable of resisting a very low temperature for weeks without injury.

**Culture Media for the Pneumococcus.** — Dr. Mosny employs the blood serum of rabbits without previous heating as a culture medium for the pneumococcus. The serum of rabbits is found to be superior to that of dogs, cattle, sheep, donkeys, and all other animals.

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## ARE MICROBES NECESSARY FOR NUTRITION?

DUCLAUX, of the Pasteur Institute, Paris, contributed to the *Comptes Rendus*, in 1885, an interesting article in which he showed that germination of beans takes place readily in a soil rich in organic matter, but wholly deprived of microbes. During this germination no change whatever took place in the soil, which was composed of milk, cooked starch, and sugar. Duclaux was led by his observations to the conclusion that the nutritive life of a young plant is practically the same as that of an animal. By means of special digestive ferments which are produced in it during the process of germination, and in some plants at a special season, as in springtime before the leaves are produced, the plant digests the food which has previously been stored up for it in the grain, or, as in the case of the maple-tree, in its roots.

When M. Pasteur was made acquainted with these researches, he took great interest in the matter, but expressed the idea that animals could not be thus nourished without the aid of microbes. He suggested, however, that some one should make the experiment of undertaking to nourish a young animal from its birth with pure nutritive substances artificially deprived of microbes. The opinion which Pasteur then expressed, that under such conditions life would be impossible, seems to have been generally adopted by bacteriologists and physiologists, although no experiments were undertaken for the purpose of obtaining scientific data upon the subject.

Nencki opposed the idea of Pasteur upon this subject, calling attention to the fact that the products of bacterial action are, as a rule, aromatic acids, fat, phenol, skatol, indol, ammonia, and gaseous substances, which are not only of no nutritive value to an animal, but are actually harmful, requiring to be eliminated by the excretory organs. "Why, then," said Nencki, "should bacteria be assigned a rôle in the process of digestion?"

Duclaux questioned Pasteur's position, on the ground that the animal body does not require the aid of bacteria in preparing for absorption the various food substances which nourish it, because it is furnished with an abundant supply of digestive fluids for this purpose, admitting, however, that there is a close resemblance between the peptones and other substances formed by bacteria, and thus produced by the animal digestive fluids.

Recently MM. Nuttall and Thierfelder, by the exercise of an infinite amount of labor and ingenuity, have succeeded in overcoming the enormous difficulties of carrying out such an experiment as suggested by Pasteur; namely, the placing of a young animal under perfectly aseptic conditions, supplying it with food and drink absolutely free from germs, removing its excrement, and maintaining its aseptic conditions for the necessary length of time. The animal chosen was a guinea-pig, which was taken from its mother by Cæsarian section performed aseptically, and placed in an ingeniously constructed apparatus in which it could be aseptically cared for, fed, and supplied with water and air, without the admission of a single microbe. The little animal soon accustomed itself to its glass house, its feeding-nipple, and the other conditions which surrounded it, and thrived so well that at the end of eight days, during which time

it had consumed thirty-five grams of food, it was found to have gained ten grams in weight. This showed a gain over its brothers who had been nourished under the ordinary conditions, being fed with non-sterilized milk, and breathing ordinary air. Not a single bacterium was found in its alimentary canal by a most careful search, every tube inoculated remaining sterile.

It is thus demonstrated, as remarked by Duclaux, that bacteria have no physiological rôle to play in the nutrition of the young animal, at least when nourished with purely animal food, though experiments have been made which indicate that with a vegetable diet, germs are more necessary than with a diet of milk.

Experiments recently made at the writer's suggestion in the Laboratory of Hygiene of the Battle Creek Sanitarium, by Professor Novy, of the University of Michigan, show that in healthy adults no living germs are to be found in the stomach at the end of the first hour of digestion when the diet consists of a thoroughly sterilized, farinaceous food. In nine test meals carefully examined, bacteria were found in only two, and in such small number that their presence might be fairly considered as accidental. Further experiments which have been made in the same laboratory by Dr. G. W. Burleigh, working under the supervision of Professor Novy, have confirmed these first observations, more than fifty cases having been observed in which no living germs whatever were found at the end of the first hour of digestion.

From these facts, the conclusion may be fairly drawn that microbes are not at all necessary to the process of nutrition, and hence that their presence is undesirable, since they produce great quantities of ptomains, toxins, and other substances which are often highly toxic in character, and which tax the antiseptic powers of the liver and the eliminative activity of the kidneys, and not infrequently give rise to various disturbing symptoms and morbid processes in the various organs.

## STERILIZATION NOT A COMPLETE SAFEGUARD.

THE mystery relating to illnesses which were formerly supposed to be due to an "inscrutable providence," for the reason that no known material cause was discoverable, has been cleared up by the investigations of modern bacteriology. It has long been known that many — most bacteria, in fact — generate poisonous substances which are capable of producing symptoms of most intense poisoning, and even fatal results within a few hours. Some of the most deadly of these poisons, known as ptomains, are produced by the action of germs upon animal foods of various sorts.

The idea that the cooking or boiling of such foods renders them perfectly safe through the destruction of the poisons which they contain, is erroneous, and has led to fatal results in not a few instances. Boiling destroys the germs, or the most dangerous ones, but does not destroy in all cases the ptomains or poisons produced by the germs. This is especially true of the poisons developed in flesh.

European experimenters demonstrated a few years ago that germs begin active development in all parts of a dead animal within twenty-four to thirty-six hours after death, even at the low temperature of an ordinary ice-box.

The *British Medical Journal* calls attention to the danger of depending upon cooking as a means of destroying these poisons, and calls attention to the fact that poisons may be more abundant in one portion of an animal than in another, so that one person might be fatally affected, while others partaking of the same sort of food at the same meal might not be injured. We quote as follows from the eminent authority named: "The poison may be extremely localized in a

particular piece of meat, the rest being free from it; and when we have to deal with a number of fish packed in the same tin, some only may be tainted.

"The prevention of food poisoning is a problem of extreme difficulty. In the meantime, however, we must remain fully alive to all the results of accurate chemical and physiological observations, and not lull ourselves into the feeling of safety while we may be face to face with death, which is all the more deplorable because it is unforeseen and accidental, though fortunately rare."

From the above it is evident that the only safe course for any one to pursue, who wishes to guard effectually against this danger, is to avoid altogether the use of the flesh of animals as food. That this may be readily done without loss of any kind may be inferred from the fact that some vegetables contain the proteid, or albuminous, elements supplied by animal food in even a larger proportion than that in which it is found in flesh. By choosing a proper assortment, such as many primitive natives have learned by experience to make, the vegetable kingdom may be made to yield a much more perfect, symmetrical, nutritious, and wholesome bill of fare than can be derived from the animal kingdom. For example, the Japanese, who subsist largely upon rice, use with the rice the Soja bean, a variety of this excellent legume which contains more than double the amount of nutrient proteid substance contained in beefsteak.

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**Mental and Nervous Influence in Disease.**— The admirable address of Dr. T. S. Clouston before the Royal Medical Society of Edinburg, at the inauguration of its session for 1895–96, presents many physiological facts of interest, bearing upon the relation of mind and body,— or rather, brain and body,— some of which must seem quite novel to those who have not made a special study of the nervous system in the light of the results of the most recent researches.

The lecturer starts out with the assertion that every bodily organ and function is represented in the cortex of the brain, by means of which all are harmonized and unified. Each neuron, with its hundreds of fibers and its thousands of dendrites, has relation to some particular part and function, and is connected not only with all other neurons, but directly or indirectly with multitudes of other similar structures which help to form the brain. Every function of the body — laughing, talking, weeping, digestion, sweating, etc.— is affected through the influence of the brain cortex.

Mental disease means cortical disease, and hence may influence every function of the body. The dry skin, the foul tongue, the constipation, the malassimilation of certain molecules, the greasy, odorous perspiration, the phosphatic urine, and the constantly flowing speech of many maniacal cases are every-day examples. The case of the doctor who loathed purgatives, but secured a good movement of the bowels, notwithstanding obstinate constipation, by putting a dose of salts near his bed at night; and the medical student who, supposing all pills to be laxative in character, was purged by a "leaden opium," are illustrations of the influence of the cortex of the brain upon the bowels; and mental influence applied in such a manner as to secure a movement of the bowels is quite as scientific as a dose of castor-oil.

The evidence that the brain cortex regulates absorption, secretion, vascular tone, as well as the various tissue changes and other activities of the body, is complete. Sores in melancholic persons will not heal. In cases of lung disease in idiots and imbeciles, there is so little resisting power against the tubercular bacillus that two thirds of them die of consumption. Sir Samuel Baker noted

that grief or hunger is nearly always followed by fever in certain parts of Africa. When in Mexico two years ago, we found that quite a proportion of chronic invalids attributed their illness to getting angry, a fit of anger in that country being usually followed by a severe illness. Death occurs in many cases, not so much because of disease as because of the diminished resisting mental and nervous force which opposes it. A bad memory and an attack of eczema in a man of seventy-five may be due to the same cause. A cheerful and buoyant mind as well as a sound brain are all-important in both the prevention and the healing of disease.

Blisters have been caused by suggestions during hypnotic conditions. Constipation has been cured by medicine containing no laxative, but accompanied by the assurance that the bowels would move within an hour. Warts have been charmed away, gout swellings have disappeared at the cry of "Mad dog" or "Fire." These are extraordinary examples of an action just as real, though less patent, of the influence which the brain is continually exercising upon other portions of the body.

Most diseases are aggravated at night when the brain is least active. Most convulsive attacks occur at that time. "What man's courage is as great at three in the morning as at midday? What man's judgment is as clear then?" "Hallucinations, as well as fears, are most apt to appear at night." "To check many diseases we cannot employ better therapeutics than to strengthen the cortex, and thus strengthen the mental energy." "To this end the first thing the good doctor does is to inspire confidence in his patient." Dr. Clouston thus presents a good foundation for a scientific mind-cure which some ingenious therapeutist will doubtless some day work out in detail.

**A Case of Oyster Poisoning.**— Cases of poisoning from the use of oysters are becoming exceedingly common. The *British Medical Journal* for January 4 reports a case of wholesale poisoning, in which the persons who attended a public ball, nearly five hundred in number, were exposed to infection with typhoid fever through the use of oysters. In quite a number of the cases the illness was very clearly typhoid fever. Investigation showed that the oysters, which were furnished by a Glasgow merchant, were obtained from a bay in Holland, the water of which was polluted with sewage. The investigation of the case has not clearly established the connection of the oysters with the enteric fever, but the bacteriological examination made showed numerous kinds and great multitudes of microbes, and other investigations have traced similar outbreaks to the oyster, by the disclosure, either in the animal itself or its juice, of the specific microbes of typhoid fever.

**Wise Words from a Wise Man.**— Said the late Dr. Goodell, who was not only a good physician but a good man: "I dare any political economist to show me one expedient whereby conception can be avoided. I challenge him to name a single preventive which will not do damage either to good health or good morals. Even natural sterility is a curse. Show me a home without children, and ten to one you show me an abode dreary in its loneliness, disturbed by jealousy or estrangement, distasteful from wayward caprice or from unlovable eccentricity."

**Hydrozone in Genito-Urinary Surgery.**— Professor J. A. Fort, of Paris, has devised a new method of dealing with strictures of the urethra by electrolysis, and has recently performed a number of successful operations in the wards of Bellevue Hospital. He reports that after electrolysis he uses an injection composed of one part hydrozone and twenty parts of water morning and evening, under which treatment the wound quickly heals.

**Resection of vas Deferens for Hypertrophied Prostate.**— The good results which have followed the operation of removal of the testicles in cases of chronic enlargement, or hypertrophy, of the prostate has led to further investigation of this subject. Leguen, a French surgeon, has recently made a series of experiments for the purpose of determining the influence of resection of the vas deferens. He removed about one and a half inches of the vas deferens, thus separating the prostate and the testicle. The results obtained were not so marked as those obtained by the removal of the testicles, but were still decided.

The question we desire to raise, is, whether it is not probable that both the testicle and the duct have an influence over the prostate, just as the ovary and the Fallopian tubes both affect the uterus. In two cases in which the writer has performed the operation of castration for relief of enlargement of the prostate, relief was complete and almost immediate. In a third case, however, relief was by no means so marked. In another case of the same kind, the writer modified the operation by the removal of as large a portion of the vas deferens as could be readily drawn out of the canal, hoping thereby to increase the effects of the operation.

**The Douche Massage.**— Any one who has ever visited Leukerbad or Aix-les-Bains and has enjoyed the pleasure of a bath at either the quaint old-fashioned bathing-place or the more modern and popular resort, must have been impressed with the peculiar efficiency of the douche massage, which consists in a rubbing, kneading, and shampooing of the patient under a strong stream of either hot or cold water. At Aix-les-Bains the patient sits upon a wooden stool while the water is poured upon him with great force from a hose with a large nozzle, the attendant at the same time kneading and rubbing with varying force and in various directions and upon different parts according to the instruction of the physician.

At Leukerbad the patient stands supporting himself by clinging to a bar or other suitable support, while the douche massage is applied to his back or sides or legs. The force of the stream applied is often so strong as to make it necessary to exert one's self considerably to keep from being forced along with the current of water, which is sometimes almost powerful enough to take one off his feet. At Leukerbad the water is commonly used at a temperature below that of the body. At Aix-les-Bains, hot sulphur water is employed. The effects of the douche massage are quite decidedly different from those of the ordinary massage, being at once powerfully stimulating and derivative.

**New Remedy for Asphyxia.**— Dr. Bier, a German physician, has made the interesting discovery that the application of ice to the mouth is an effective means of exciting respiration.

## REVIEWS.

DONT'S FOR CONSUMPTIVES, OR THE SCIENTIFIC MANAGEMENT OF PULMONARY TUBERCULOSIS.— The above is the title of a work of thirty-five chapters prepared by Dr. Charles W. Ingraham, of Binghamton, N. Y., issued by the Medical Reporter Publishing Co., Rochester, N. Y.

The work is devoted to the general management of pulmonary invalids, in which the author undertakes to present the rational methods of dealing with this great class of patients especial attention being given to non-medicinal agents. The author writes in a lucid and popular manner, making the work such an one as the physician can safely put into the hands of the patient as a mentor. The book will be of service to both physician and aptient in combating this dire malady.

The recognition of the importance of regimen in dealing with consumption has been the means of saving many thousands of lives, until consumption is no longer looked upon as a hopeless malady, but as one in which scientific management and faithful and persevering effort may bring about most encouraging results.

# The Battle Creek Sanitarium
# LABORATORY OF HYGIENE.

J. H. KELLOGG, M. D., Superintendent.
GEO. W. BURLEIGH, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
A. B. OLSEN, B. S., M. D., Pathologist.
W. A. GEORGE, M. D., Chemist.

**Monthly Resumé of Work Done.**

## REPORT OF EXAMINATIONS OF BLOOD.

FOR JANUARY.

| Blood Count. | Men. | Women. | Total. |
|---|---|---|---|
| Between 4,500,000 and 5,000,000 | 29 | 5 | 34 |
| " 4,000,000 " 4,500,000 | 25 | 38 | 63 |
| " 3,500,000 " 4,000,000 | 4 | 22 | 26 |
| " 3,000,000 " 3,500,000 | | 7 | 7 |
| " 2,500,000 " 3,000,000 | 1 | 1 | 2 |
| " 1,500,000 " 2,000,000 | 0 | 1 | 1 |
| Totals | 59 | 74 | 133 |

| Hemoglobin. | Men. | Women. | Total. |
|---|---|---|---|
| 100 | 14 | 8 | 22 |
| 97 | | 3 | 3 |
| 96 | 2 | | 2 |
| 95 | | 1 | 1 |
| 93 | 19 | 27 | 46 |
| 87 | 1 | | 1 |
| 86 | 1 | | 1 |
| 85 | 11 | 14 | 25 |
| 79 | 8 | 12 | 20 |
| 78 | | 2 | 2 |
| 75 | 1 | | 1 |
| 72 | 2 | 5 | 7 |
| 30 | | 1 | 1 |
| 28 | | 1 | 1 |
| Totals | 59 | 74 | 133 |

**Gastric Laboratory Report for January.**— Regular chemical analysis of the stomach fluid was made in 84 cases; experimental analyses, 33; examinations of the stomach fluid of a dog, 8; total, 125.

The number of patients received from each State was as follows: Michigan, 44; Indiana, 10; New York, 4; Wisconsin, 4; Illinois, 3; Iowa, 3; Ohio, 3; Colorado, 2; Kentucky, 2; Louisiana, 2; Texas, 2; Canada, 1; California, 1; Kansas, 1; Minnesota, 1; Maine, 1; South Dakota, 1; Tennessee, 1; Virginia, 1. Total, 87.

**Microscopical Examination of Sputum for January.**— Number of examinations made, 36; number of cases, 29; number of specimens in which tubercle bacilli were found, 14.

Patients whose sputum contained tubercular germs, were received from the following States: Michigan, 9; Texas, 1; Colorado, 1; Iowa, 1; Mississippi, 1; Ontario, 1. Total, 14.

**Urinary Laboratory Report for January.**— Number of specimens examined, 273; number of cases, 217. Number of specimens in which albumin was found, 23; pus, 56; blood, 3; sugar, 6; bile, 2; casts, 5; number of specimens examined for toxicity, 2; number of specimens examined for total nitrogen, 5; number of cases examined for total nitrogen, 2.

# PUBLISHERS' DEPARTMENT.

AN ADDITION TO THE DIET IN DISEASES OF THE GASTRO-INTESTINAL TRACT.—There is no class of diseases in which a nicer discrimination is called for in the matter of diet than in affections of the gastro-intestinal tract. Milk, which has been employed to a great extent in these cases, not infrequently excites repugnance, disturbs the impaired digestive process, and is therefore imperfectly assimilated. It must also be remembered that the comparatively large quantities in which it must be administered to maintain the nutrition, sometimes increase the existing irritation of the mucous membrane. In the *Deut. Aerzte. Zeitung* of Oct. 15, 1895, Drs. Gerdes and Susewind state that they have found Somatose, the new food product, of especial utility in the latter condition. As an illustration of its value, they cite a case of severe gastro-enteritis in which all other fluid foods given in larger quantities had been vomited, while the employment of a strong solution of Somatose (one heaping teaspoonful to three tablespoonfuls of water) not only tided the patient over a critical period of fourteen days, but exerted a very favorable influence upon his strength. Despite the continuous high temperature (usually 39.5° to 40° C. at night), the patient was able to leave the bed of his own accord when the fever had subsided. Although the Somatose solution was administered, at first three times, later four or five times, daily for a period of fourteen days, the patient never manifested repugnance, and even during the stage of convalescence, relished its addition to soups or other foods. As an addition to the ordinary diet of anemic and nervous persons, it proved of great value, being well borne, and perfectly assimilated for a long time. In the cases observed by these physicians, an increase of strength occurred within a comparatively short time, and in chlorosis a rapid disappearance of the menstrual disturbances, headache, vertigo, etc., was noted. In some instances, after the use of Somatose a remarkable improvement took place in the digestion; while all patients experienced an increase of appetite which persisted after its discontinuance. Owing to its almost absolute tastelessness, it is especially adapted for the alimentation of children troubled with loss of appetite and to hysterical persons, as it can be added to other foods without impairing their flavor. Somatose, in the solution previously referred to, seems pre-eminently indicated as a nutriment in case of cancer of the stomach and esophagus, where only small quantities of food can be ingested, or after gastrostomy, since its ready assimilability precludes the occurrence of digestive disturbances.

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FOR BETTER ROADS.—The governor of Michigan has set a good example for the chief executives of other States in calling a "Good Roads" convention, which is asked to meet in the city of Lansing March 3, 1896, at 2 P. M. The improvement of our public roads is a matter in which every good citizen should be interested. No civilized country in the world possesses such wretched roads as are to be found in America. In England, France, Germany, Switzerland, and even in poor Italy the public highways are almost invariably found in excellent condition, the inhabitants of these old countries having learned long ago that a poor road is an expensive luxury, and one which no government can afford to maintain.

Hon. Alfred A. Pope, of the Columbia Bicycle Company, and others have for a number of years past continually called attention to the enormous loss occasioned to farmers and others by bad roads. It is to be hoped that this convention will devise some satisfactory means for correcting this great evil.

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THE nineteenth annual meeting of the American Microscopical Society will be held at Pittsburg, Pa., Aug. 18, 19, 20, and 21, 1896. All workers in the microscopical sciences are invited to be present. Blanks for application for membership, also titles of papers, should be sent to the secretary before July 15, 1896. Address, William C. Krauss, M. D., Secretary, 382 Virginia St., Buffalo, N. Y.

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# Caramel-Cereal,

**for the last twenty years,** has been used by the thousands of invalids who annually visit the great Sanitarium at Battle Creek, Mich.

**UNCONSCIOUS POISONING.**—An old physician of Chicago remarked the other day: "Thousands of people are poisoning themselves daily with tea and coffee without knowing it. A great number of nervous maladies, and indigestion in various forms, are the result of the deleterious effects of the poison of tea and coffee upon the system. I myself made the discovery a good many years ago, that the headaches from which I had suffered for years, were due to the use of tea and coffee. I found whenever I took a cup of strong coffee, I had a headache as the result, and I had headaches now and then in spite of what I considered my great moderation in the use of tea and coffee. I concluded to dispense with them altogether, and when I did so, my headaches disappeared and did not return. I have cured scores of chronic headaches by forbidding the use of tea and coffee."

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## MALTED GLUTEN.

THE lack of fat and blood is coming to be so universal among Americans as to be almost characteristic. Our typical countryman has a "lean, hungry look," as Cæsar said of Cassius. The leanness is an evidence of the impaired nutrition which he suffers, more or less, as the result of indigestion. The most universal of all forms of indigestion is the inability to digest starch and fats. This doubtless arises from several causes, the chief of which we believe to be the following: —

1. Hasty eating, whereby the food is improperly divided, and an insufficient quantity of saliva is mingled with the food to convert the starch into sugar, as in the normal process of digestion.

2. The use of imperfectly cooked food. Grains which require cooking for from three to five hours to secure prompt digestion are often served at the table after fifteen to thirty minutes' cooking. The manufacturers of various preparations of oats and other grains are largely responsible for this, and have done a vast deal of mischief by printing upon their packages such statements as, "Steam Cooked," "Requires only Fifteen Minutes' Cooking," "Ready for Use in Three Minutes," all of which are untrue. We know of no preparation of oatmeal in the market which does not require cooking at least two or three hours to properly prepare it for the stomach. Raw and imperfectly cooked starch will not digest in the stomach, but will ferment, producing acidity, and thus preventing the digestion of other food.

3. The use of tea and coffee, vinegar, pickles, sour wine, and other acids at meals, all of which absolutely prevent the digestion of starch in the stomach.

4. The use of candy, sugar, preserves, and other sweets, whereby fermentation is promoted, and the digestive organs weakened.

5. The use of mushes, soups, and other soft foods, or "slops," to the comparative exclusion of dry foods. This is perhaps the most important of all causes of starch indigestion.

6. The use of free fats in the form of butter and salad oils, and the admixture of free fats, such as butter, lard, suet, etc., with food in cookery, as in pie-crust, cake, rich gravies, sauces, etc.

These causes, acting singly or in combination, have given rise to such a prevalence of this special form of indigestion as to produce actual modifications in the physical appearance of the average American. Of the multitudes of invalids who are daily suffering martyrdom from heartburn, sour stomach, bloating, eructations of gas, intestinal flatulence, colic, and other distressing symptoms, many might be cured by a combination of appropriate treatment with correct dietary, but there is still left a large number whose digestive organs have been so abused that there is little hope of their being restored to soundness, and the individuals must, in consequence, adopt a dietary suited to the crippled condition of these organs. Some persons of this class find relief in the adoption of a dietary consisting simply of fruits and nuts; others, in an almost exclusive meat diet, not knowing that the temporary palliation of their symptoms is obtained only at the expense of greater suffering in the end.

**Malted Gluten** has been prepared especially to meet the wants of this class. In **Malted Gluten** the fat-forming element is represented by digested starch, or maltose, and the blood-forming element by the gluten of choice wheat. The maltose contained in **Malted Gluten** is not a product of the chemical laboratory, but of a natural diastatic digestion, which is precisely the same in character as that resulting from the action of saliva upon starch. **Malted Gluten** thus presents the fat-forming element in the state in which it is found at the end of stomach digestion. The blood-forming element of

**Malted Gluten** is in a state of fine division, so that when it is taken into the stomach, its fat-forming element is ready for immediate assimilation, and its blood-forming element for very prompt digestion.

**Malted Gluten** meets a lack in medical dietetics which has long been recognized, but has never before been supplied. It has the advantage over various meat preparations, such as meat powder, peptones, peptonoids, beef pulp, beef extract, etc., that it is of vegetable origin, and hence free from tissue toxins, ptomains, and other deleterious elements.

**Malted Gluten** is also a food, supplying not only the nitrogenous, or blood-making, but the fat-making, element as well, which is not supplied by meat preparations of any sort; so that it may be relied upon as an exclusive source of nourishment in case of necessity. It agrees well with the most feeble stomach, and for those unable to digest fat in any form, its value can scarcely be estimated. It is a carefully sterilized food, thoroughly cooked, ready for immediate use, besides being very palatable. In the form of thin gruel, no better food could be found for a badly nourished infant which does not do well on a milk diet. It is especially valuable for patients suffering from dilatation of the stomach and hypopepsia.

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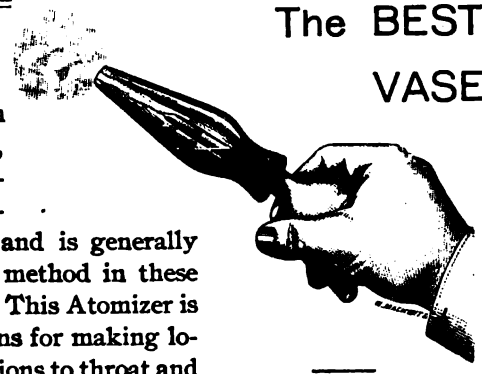

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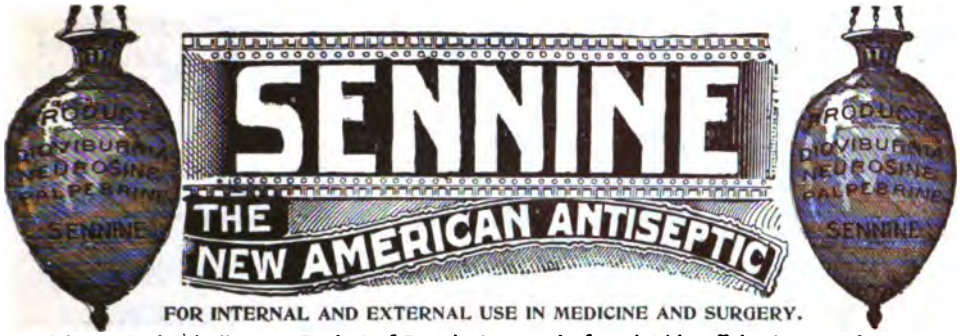


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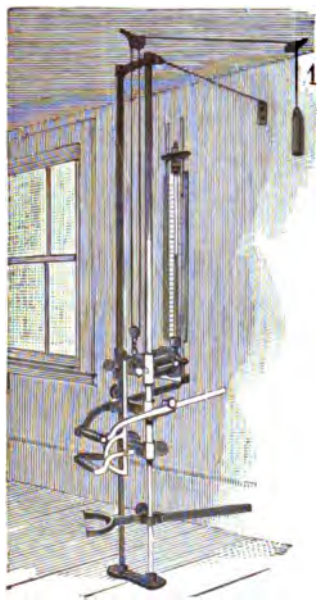

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BY J. H. KELLOGG, M. D.,

Superintendent of the Battle Creek (Mich.) Sanitarium, Member of the British and American Associations for the Advancement of Science, the American Microscopical Society, the Society of Hygiene, of France; Author of the Home Hand-Book of Domestic Hygiene and Rational Medicine, Etc., Etc.

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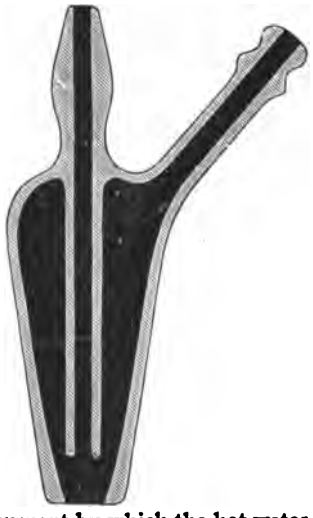

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| a m | p m | p m | | | | p m | p m | pm | | a m |
| 9.00 | 3.10 | 8.15 | a m | ..... | ..D.Chicago A.. | 5 45 | 1.50 | 9.10 | ..... | 7.50 |
| 11.25 | 5.05 | 10.30 | 6.00 | ..... | ..Valparaiso.. | 5.05 | 11.35 | 7.10 | ..... | 5.45 |
| p m | | | | | | | | | | |
| 1.05 | 6.30 | 12.00 | 10.05 | ..... | ..South Bend.. | 3.10 | 10.15 | 5.44 | ..... | 4.10 |
| 1 46 | 7.12 | 1 .45 | 12.40 | ..... | ..Cassopolis .. | 2.15 | 9.40 | 5.13 | ..... | 3.28 |
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| 2.44 | 7.56 | 1.48 | 4.20 | a m | ..Vicksburg.. | 1.10 | 8.52 | | p m | 2.37 |
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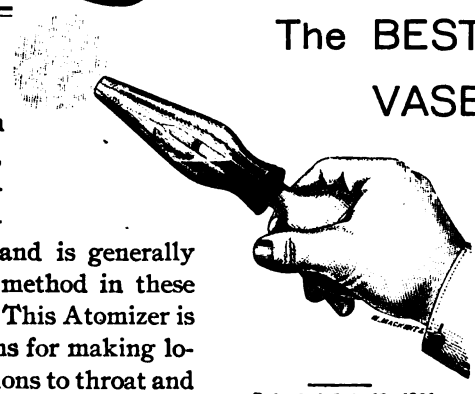

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# MODERN MEDICINE

AND

## BACTERIOLOGICAL REVIEW.

VOL. V. BATTLE CREEK, MICH, U. S. A, MARCH, 1896. NO. 3.


## ORIGINAL ARTICLES.

### A NEW ATAXIAGRAPH.


BY W. H. RILEY, M. D.,

Sanitarium, Battle Creek, Mich.

Member of the American Neurological Association, etc.


ABOUT four years ago it occurred to the writer that in the study and examination of certain diseases of the nervous system, such as locomotor ataxia, multiple neuritis, etc., some means by which the amount of inco-ordination of movements, or the extent of ataxia in standing and in walking, could be accurately measured, would be a valuable help. Accordingly, such an apparatus was made for measuring the movements of static ataxia, or the irregular swaying movements of the body which are present in certain diseases of the nervous system when the patient attempts to stand still with the feet together in one position.

This instrument has been improved from time to time until about a year ago, when the apparatus as shown in Fig. A was perfected, and has proved to be very useful and satisfactory in the examination of nervous diseases. The instrument may be briefly described as follows:—

All the parts of the instrument except the wooden disk are made of metal,—iron and steel.

1 is an iron rod three fourths of an inch in diameter, four feet in length up to the elbow above; from the elbow, it extends out six or eight inches horizontally. This iron rod passes through the sockets 11 and 11′. The sockets being fastened to the wall or some solid support by screws, the rod may be moved up or down through the sockets, and fastened at any desired point by means of the thumb-nuts 4 and 4′. By this means disk 2 may be adjusted to the height of any individual.

5 is a steel spring which supports the disk.

6, 7, 8, and 9 are movable joints. The steel spring 5 and the four movable joints allow the disk to move up and down with the slightest pressure, which may be produced by the swaying movements of the body of the patient.

3 is a rope which passes through the pulleys, and to which a weight is attached, as shown in the cut.

The disk 2 is eighteen inches in diameter, and is slightly concave on the lower side.

10 is a framework made of heavy leather, which is placed on the head of the patient as shown in the figure. At the top and center of this framework is placed a soft lead-pencil for tracing the movements of the body. The pencil, which is attached to the framework on the head, marks on a piece of white cardboard, which is fastened to the wooden disk by means of thumb-tacks. This cardboard is marked with concentric circles, the circumferences of which are one centimeter apart. The purpose of these circles is to measure the distance that the patient's body moves from the center.

In using the apparatus, a plumb-line should be dropped from the center of the disk to the floor, and the point where the line strikes the floor should be marked. The frame supporting the pencil should be placed on the patient's head, he taking a position directly under the center of the disk, and standing so that the pencil in the frame will be in the center of the disk, with his feet placed so that the mark on the floor will be between the middle of his feet.

By this arrangement the tracing made

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by the movements of the body when the patient is attempting to stand still with the feet together is marked by the pencil on the cardboard, which is fastened to the disk above the head of the patient. A tracing can be made thus with the eyes open or closed, as may be desired, and comparisons made of these.

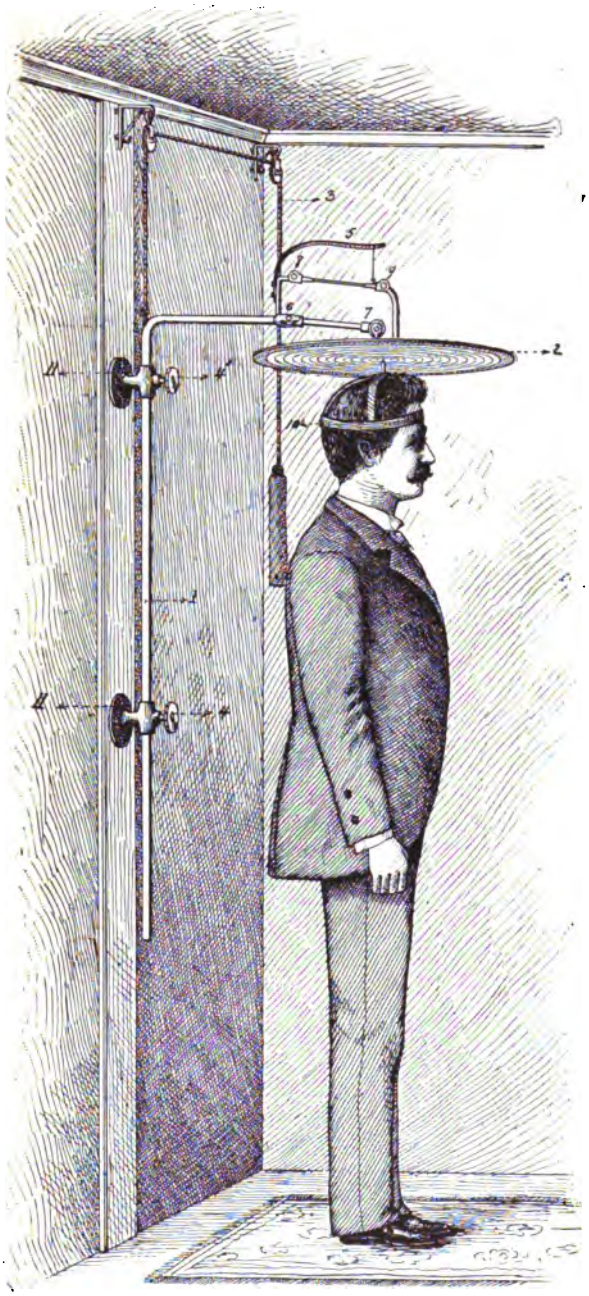

FIG. A. The author's ataxiagraph, showing position of patient when the ataxiagraph is in use.

Fig. 1 represents the tracing made by the movements of the body of a healthy individual when attempting to stand still with the feet close together and the eyes open.

Fig. 2 represents the tracing of the movements made by the body of the same individual attempting to stand still with the feet together and the eyes closed.

Tests were made with this apparatus on sixty adult individuals in good health, with the idea of determining, if possible, the extent of the movements of the body when the individual is attempting to stand still with the feet close together, and with the eyes open in one case, and with them closed in the other. It was found from these tests that the extent of the movements of the body under the conditions above referred to varied with different individuals, and that the swaying of the body was seldom as great as in the very early and incipient stages of diseases in which inco-ordination of movements is a symptom; and that in nearly every instance it was increased by the closing of the eyes. To illustrate, an individual whose movements would extend two centimeters from the center with the eyes open, would extend to the distance of four centimeters or more from the center when the eyes were closed. These swaying movements of the body which are present in healthy individuals in attempting to stand still with the feet close together are decidedly increased in certain diseases, notably in locomotor ataxia, multiple neuritis, cerebellar disease, neurasthenia, etc.; and these abnormal movements of the body are intensified in these diseases when the guidance of vision is withdrawn by closing the eyes, so that this test, which is quite delicate, is valuable in the examination of patients suffering with the above and other diseases, and is a material aid in forming a diagnosis.

The crooked line starting from the center in Fig. 3 represents the extent of the movements of the body in a case of neurasthenia when the patient attempts to stand still with the feet together and the eyes open.

The crooked line starting from the center in Fig. 4 represents the movements of the body of the same case, that is, neurasthenia, when the patient attempts to stand still with the feet together and the eyes closed.

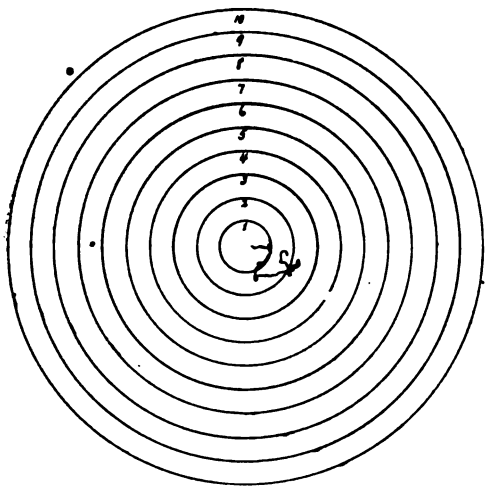

FIG. 1. Tracing of the movements of the body of a healthy subject when attempting to stand with the body in one position, feet together and eyes open.

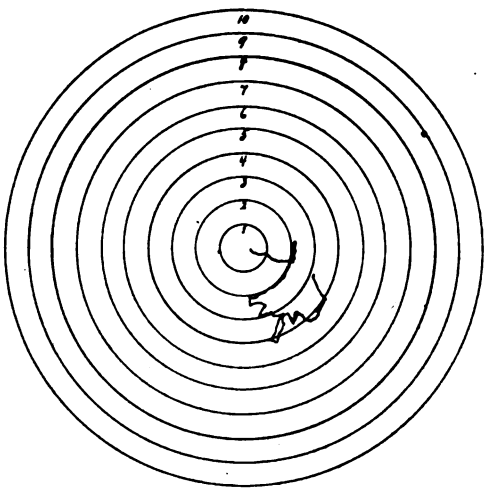

FIG. 2. The same as Fig. 1 with eyes closed.

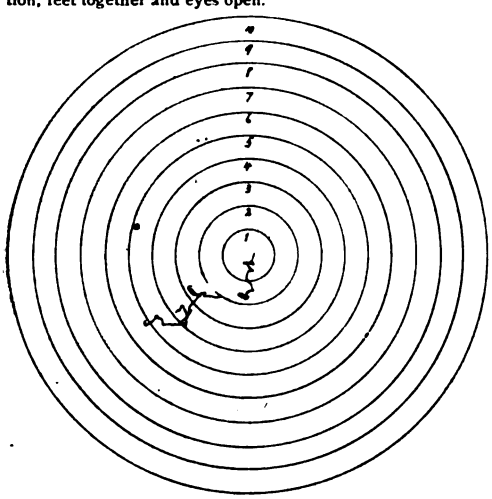

FIG. 3. Tracing of the movements of the body in a case of neurasthenia when attempting to stand with feet together and eyes open.

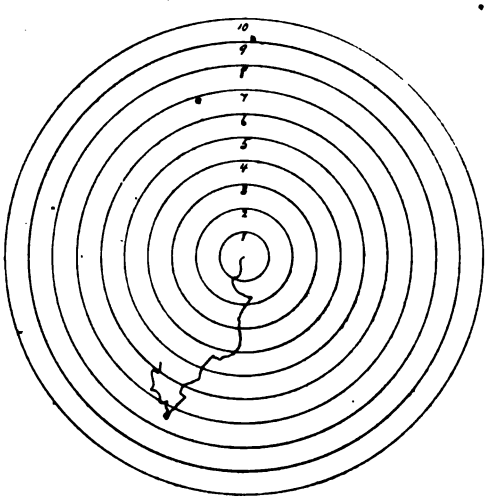

FIG. 4. The same as Fig. 3 with eyes closed.

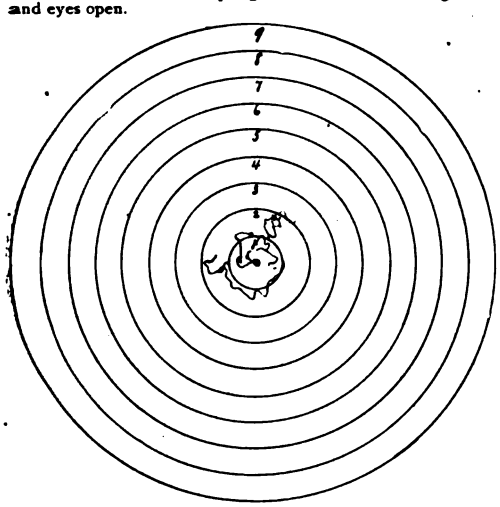

FIG. 5. Tracing of the movements of the body in a case of incipient locomotor ataxia. Patient standing with feet together and eyes open.

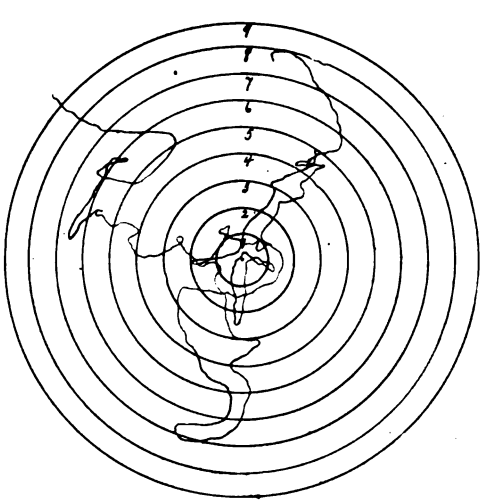

FIG. 6. The same as Fig. 5 with eyes closed.

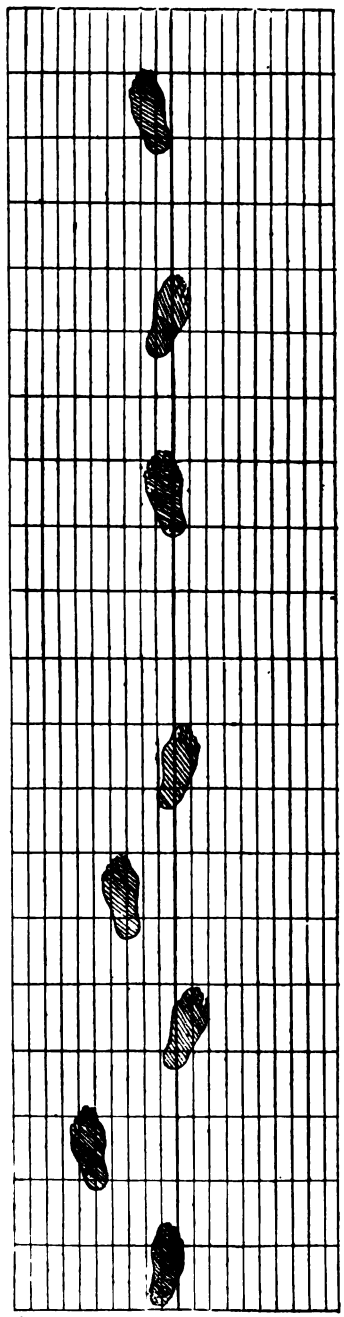

FIG. B. Diagram showing relative position in which the feet are placed in a case of incipient locomotor ataxia when attempting to walk on the heavy line in the middle of the plat with the eyes open.

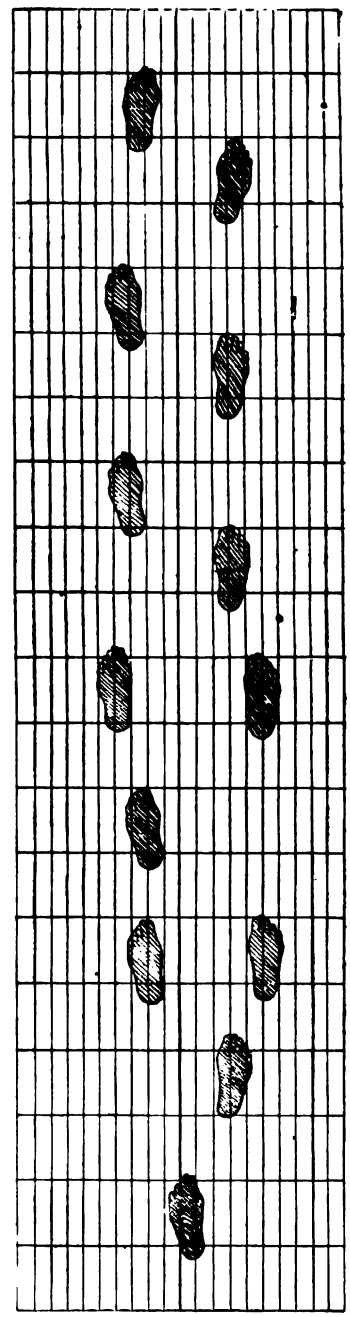

FIG. C. The same as represented by Fig. B except that the patient's eyes are closed.

Fig. 5 is a tracing of the movements of the body with the feet together and eyes open in very early stages of locomotor ataxia.

Fig. 6 represents a tracing of the movements of the body of the same patient in the early stages of locomotor ataxia, with the eyes closed.

By comparing the movements of the body with the eyes open, with those made with the eyes closed, in each of the three cases referred to above, it will be seen that the swaying of the body is greatly increased by closing the eyes in a healthy person, as in the two diseases referred to.

The zigzag lines starting from the center of the concentric circles represent the tracing-line in each case.

Figs. B and C represent an arrangement for determining the amount of ataxia in locomotion. This arrangement can be made by marking parallel white lines lengthwise, five centimeters apart, on a piece of black cotton cloth. In the center there should be a heavy or double line, and on each side of the double line any number of parallel lines desired may be drawn. As shown in the illustration, Fig. B, there are ten parallel lines, five centimeters apart, on each side of the double line in the center, which is usually sufficient for ordinary purposes. At right angles to these lines just mentioned, which run lengthwise on the cloth, other lines are drawn crosswise on the cloth, twenty centimeters apart; the number of lines necessary, of course, will depend upon the length of the plat. Fig. B represents a plat which is four meters in length, a length quite sufficient for practical purposes.

In using this arrangement the patient first attempts to walk on the heavy double line in the center with his eyes open. Another test is made in which he attempts to walk on the heavy double line in the center with his eyes closed. These can be compared one with the other.

Fig. B illustrates the movements of the limbs and the position of the feet in a case in the very early stage of locomotor ataxia, the patient attempting to walk on the heavy line with his eyes open.

Fig. C illustrates the movements of the limbs and the position in which the feet are placed in attempting to walk on the double line in the center with the eyes closed. This is the same case as Fig. B in a very incipient stage of locomotor ataxia.

The bottom of the patient's feet are covered with starch before beginning to walk on the double line in the center of the plat. (Anything that will leave a mark will answer the same purpose.) By this means the position of the feet can be readily determined, as the starch leaves a mark on the cloth where the feet were placed. A similar arrangement might be made by marking lines on the floor or on heavy manila paper.

This arrangement for measuring the inco-ordination in the movements of the legs and body in locomotion is valuable in the examination of cases in the very early stage of locomotor ataxia, and in neurasthenia, multiple neuritis, and diseases of the cerebellum; in fact, in any case where the physician is desirous of measuring accurately the amount of inco-ordination of the movements of locomotion. Examinations can be made from time to time by this arrangement. A reduced form of the plat, with the marking showing the position of the feet, can be preserved with the records of the case; the size as shown in Fig. B being a convenient size for the purpose of keeping on file or record. By this arrangement, comparisons can be made from time to time, showing whether the inco-ordination of the movements is increasing or decreasing. In a chart of this kind one always has before him a record of the amount of inco-ordination of the movements of the limbs, which is more expressive and more accurate than could possibly be given in words, as the marking of the position of the feet on the chart tells at a glance the extent of the inco-ordination of the movements.

## WHAT IS THE MATTER WITH THE AMERICAN STOMACH?[1]

### NEW AND EXACT METHODS OF FINDING OUT.

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Battle Creek, Mich.

(Continued.)

### THE INFLUENCE OF MOIST AND DRY FOOD UPON SALIVARY SECRETION.

A SERIES of experiments made to determine the influence of moist and dry

[1] Presented at the Annual Meeting of the Mississippi Valley Medical Association, held at Detroit, Mich., Sept. 4-6, 1895.

food, natural food-flavors, and condiments or unnatural food-flavors upon salivary digestion, developed very striking and unexpected results, which I quote from another paper in which the outcome of these researches is presented in greater detail: —

The quantity of food or fluid was, in each case, thirty grams. The food, whether solid or fluid, was taken into the mouth in small portions and chewed for a few seconds, when, being rejected from the mouth, it was received into a small vessel for weighing. The length of the experiment with each substance lasted exactly five minutes. The difference in weight between the substance after chewing and before, represented the amount of saliva which had been added to it during mastication. I may add that the solid food used was granose, a dry and well-cooked preparation of wheat in thin flakes.

Thirty grams, or one ounce, of granose increased in weight 59.79 grams, or two ounces.

Thirty grams, or one ounce, of granose, with two grams of common salt, increased in weight 58.80 grams, or a little less than two ounces.

Thirty grams, or one ounce, of granose sprinkled with pepper increased in weight 59.1 grams, or not quite two ounces.

Thirty grams, or one ounce, of granose, with 5 c.c. of strong cider vinegar, increased in weight 55.9 grams, or about one and five-sixths ounces.

Thirty grams, or one ounce, of moist bread increased in weight 31.1 grams, or one ounce.

Thirty grams, or one ounce, of raw apple increased in weight 38.1 grams, or one and one-fourth ounces.

Thirty grams, or one ounce, of water increased in weight 2.92 grams, or one tenth of an ounce.

Thirty grams, or one ounce, of milk increased in weight 2.82 grams, or one eighth of an ounce.

Thirty grams, or one ounce, of pea soup increased in weight 5.82 grams, or one fifth of an ounce.

Paraffin chewed for five minutes produced 20 c. c. of saliva, or two thirds of an ounce.

The facts developed by the above-mentioned experiments furnish the foundation for most important therapeutic rules for the management of digestive disorders. It will be noted, on the one hand, that one ounce of dry granose chewed for five minutes so stimulated the activity of the salivary glands as to enable them to produce almost exactly two ounces of saliva, or three times the amount normally secreted by the young man who was made the subject of the experiment; on the other hand, the amount of saliva secreted when water was passed through the mouth amounted to a little less than 3 c. c. in five minutes, or about one seventh of the normal amount. With dry granose the amount of saliva secreted was *more than twenty times as great as with water.*

With moist bread the amount of saliva secreted was almost exactly half that with dry granose.

With milk the amount of saliva produced was only about one third more than that produced with pure water.

With pea soup the quantity was just twice as great as with water, but the amount was still only one tenth the amount produced with dry granose.

This fact places before us in the most graphic and emphatic manner the necessity for the use of dry food in cases of salivary indigestion. Instead of feeding our patients with malt, pancreatin, diastase, and predigested foods, we have only to require them to chew dry food; and in so doing they will develop in abundant quantity a starch-digesting ferment of greater value, because better adapted to the human stomach, than any possible artificial digestive agent which could be administered.

The use of "slops" is one of the most common dietetic errors among the American people. The American eats in a hurry, rinses down his food with copious draughts of tea, coffee, iced water, iced milk, or iced tea, and in consequence the salivary glands are not stimulated to proper activity, and so the amount of saliva produced is altogether inadequate to digest the starchy elements of food in the acid medium of the stomach contents, and the small amount produced is so diluted that its efficiency is greatly impaired. What wonder that starch indigestion is coming to be an almost universal complaint, as shown by acidity, eructations of gas, flatulence, and a great variety of stomach disturbances, to escape from which multitudes are continually swallowing quantities of magnesia, soda, neutralizing cordials, and alkaline min-

eral waters of various sorts, together with malt extracts and other digestants?

The inability to digest starch is doubtless one of the great causes of the inordinate consumption of beef and other animal products to which the average American has come to be addicted, not altogether in imitation of his English cousin, but as a method of escaping the pangs of starch indigestion.

The abundant provision made in the human body for the digestion of starch, — first, the saliva; second, the bile and pancreatic juice; third, the intestinal juice; and finally, the liver, — is evidence that nature intended man to subsist largely upon farinaceous foods. The arguments of the "natural food" advocates, who insist that man should live upon fruits and nuts, are based, not upon physiological facts, but upon the pathological experiences of the disciples of this doctrine. The writer having an opportunity, a year or two ago, to examine the stomach fluid of one of the most earnest and stalwart advocates of the fruit-and-nut diet, found the stomach greatly dilated, and almost completely inert.

I have cured many scores of chronic and very obstinate cases of dyspepsia by simply requiring the patient to subsist upon a dry diet, whereby he was compelled to thoroughly masticate his food. A favorite prescription with the writer, which is applicable to most cases of indigestion, is two or three ounces of dry granose at the beginning of each meal. This introduces into the stomach an abundant quantity of saliva, — probably from four to six ounces in most cases, — and insures efficient starch digestion in cases of both hypopepsia and hyperpepsia. It also serves to mitigate the acidity of hyperpepsia, and operates to prevent fermentation by the rapid solution and conversion of the farinaceous elements, thereby promoting their absorption. I am inclined also to the opinion that the maltose produced by the salivary secretion exercises in some way a controlling and beneficial influence on the processes of stomach digestion. The density of the stomach contents must have something to do with the chemical changes which occur during digestion. The presence of maltose in proper quantity may be the means of aiding glandular activity and absorption.

This is a subject which I am endeavoring to investigate, and upon which I hope to be able to throw some light by further experiments.

At a recent meeting of the American Medical Association, in a discussion which occurred upon a paper read by the writer, in which vinegar had been condemned on account of its powerful inhibitory influence upon salivary digestion, one of the speakers suggested that the stimulating effect of vinegar upon the salivary glands, thereby promoting the secretion of saliva, might more than counterbalance the inhibitory influence of this condiment, — in other words, the extra amount of saliva produced by the vinegar might more than balance the lessened activity of the secretion resulting from the presence of this acid. The same thought was expressed in reference to salt, pepper, and other condiments. I consequently subjected this matter to experiment, with the results already stated in this article. The amount of saliva secreted when salt, pepper, or vinegar was added to the granose, was in each case less than when the granose was taken by itself. In the case of vinegar the deficiency was much greater than with the other condiments.

We see from this that dryness is the property in food which stimulates the salivary glands to activity. A perfectly dry food excites the maximum amount of activity. The degree of stimulation produced by a dry food, such as granose, is indeed surprising, the amount of saliva secreted during the five minutes required for the mastication of the somewhat bulky granose (the young man masticated the food as rapidly as possible, ejecting it from the mouth as soon as it became well moistened) being twice the weight of the granose itself. The slightly lessened stimulating effect observed when pepper was added was probably accidental, as the figures agree as nearly as three experiments with granose alone would be likely to agree. However, the amount with vinegar is perceptibly less, showing that nature does not propose to waste energy in secreting saliva to be spoiled; in other words, a substance which destroys the activity of the fluids produced, is not capable, apparently, of promoting the activity of the salivary glands in the secretion of saliva. I do not undertake to lay this down as a general principle, but it seems to hold good in relation to vinegar at least. I have planned an exten-

sion of this experiment as a side-line of this interesting inquiry.

Another experiment of interest in the same connection was made for the purpose of determining the relative value of natural flavors; that is, such flavors as are found in natural and wholesome foods, in stimulating the secretion of saliva.

The mastication of an ounce of apple within five minutes produced 34 c.c. of saliva, 3 c.c. more than was produced in the mastication of moist bread. The proportion of water in the apple was certainly not less than that in the moist bread, nevertheless a larger amount of saliva was secreted, resulting doubtless from the stimulating effect of the natural flavors of the apple.

I have not space in this paper to go further into the practical deductions which may be drawn from these experiments. The subject is a comparatively new one, as almost no experimental work has been directed toward it, probably in consequence of the generally received assumption that the activity of the saliva upon the food ceases as soon as it enters the stomach. More recently developed physiological facts in relation to salivary digestion, which are very clearly stated by Freirichs, Ewald, Gamgee, and other excellent authorities, must lead to a revolution, not only in relation to our way of looking at stomach digestion, but also in relation to the therapeutics and dietetics of a large class of digestive disorders.

The extensive use of malt preparations of various kinds and the benefit recognized by many physicians, arising from the employment of diastatic ferments, substantiate the statement previously made in this paper that the inability to digest starch is one of the most common conditions existing among dyspeptics. In the examination of more than fifty-three hundred stomach fluids, I have found that the conversion of starch was complete in less than three hundred cases, and in quite a large number of cases there had been chemical evidence of little or no conversion. It is evidently, then, a matter of importance to know what substances, if any, interfere with starch digestion. The following is a brief resumé of the observations which I have made upon this point: —

EXPERIMENTS RELATING TO SUBSTANCES WHICH IMPEDE STARCH DIGESTION.

| | Time. |
|---|---|
| Oxalic acid: | |
| 1–10,000 | No action. |
| 1–15,000 | 35 minutes. |
| 1–20,000 | 19 " |
| 1–30,000 | 4 " |
| Lemon juice: | |
| 1–200 | No action. |
| 1–500 | 42 minutes. |
| 1–2,000 | 9 " |
| 1–5,000 | 7 " |
| Orange juice: | |
| 1–200 | 11 minutes. |
| 1–500 | 4 " |
| Apple juice: | |
| 1–50 | 45 minutes. |
| 1–200 | 4 " |
| Vinegar: | |
| 1–200 | No action. |
| 1–500 | 40 minutes. |

Experiments were also made for the purpose of determining comparatively the influence of the same substances upon the action of malt diastase upon starch. The preparation of diastase used was a malt extract, one c.c. of which was capable of completely converting one-tenth gram of starch in two minutes. The following were the results: —

| | Time. |
|---|---|
| Oxalic acid: | |
| 1–2,000 | No action. |
| 1–5,000 | 5 minutes. |
| 1–10,000 | 2 " |
| Lemon juice: | |
| 1–10 | No action. |
| 1–200 | 2 minutes. |
| Apple juice: | |
| 1–10 | 2 minutes. |
| Vinegar: | |
| 1–10 | 10 minutes. |
| 1–200 | 2 " |
| Hydrochloric acid: | |
| 1–4,000 | No action. |
| Lactic acid: | |
| 1–200 | No action. |
| 1–2,000 | 5 minutes. |

Several points of interest may be deduced from these experiments. A few may be briefly mentioned: —

1. Acids of all kinds inhibit the diastatic action of both saliva and malt, but human saliva is very much more susceptible to the inhibitory action of acids than is malt.

We find here an explanation for the observation previously made by patients,

that sour fruits disagree with them; but to test the matter further, I administered a number of experimental breakfasts in which vinegar and other acids were added to the stomach fluid. When one-half ounce of vinegar was added to the meal, it was found that the coefficient of starch digestion was reduced to .64. With the juice of one lemon, the coefficient was reduced to .29.

These experiments show very clearly that vegetable acids as well as the acids of the gastric juice have a decidedly deterrent effect upon starch digestion, and hence that they must be withheld in cases in which the digestion of starch is performed imperfectly or with difficulty. It is also apparent from the observations previously made that it is in cases of hyperpepsia especially that acids must be withheld, since in hyperpepsia starch digestion is already more or less interfered with by an excessively acid gastric juice.

The observations of Roberts, as well as my own, show that tea and coffee inhibit the action of the saliva upon starch to a very remarkable extent. Brinton, Wolff, Debove, and Reymond all assert that caffein diminishes the activity of the peptic glands, which accounts for the deleterious effects of tea and coffee upon digestion.

Gerard has shown that chlorid of sodium, when taken in excessive quantities, interferes with gastric digestion by provoking a profuse secretion of mucus, whereby the gastric juice is neutralized and its action upon the food impeded.

### PEPTOGENS VERSUS DIGESTIVE FERMENTS.

With reference to substances supposed to aid digestion, it is surprising that so small an amount of attention has been given experimentally to the influence of pepsin upon digestion, when the enormous quantities of this and other digestive agents used are taken into consideration.

Some years ago Mosso, by experiments upon a dog, determined that the stomach of a dog of ordinary size was able to furnish pepsin enough to digest seventy kilograms, or 165 pounds, of albumen. This fact was ascertained by passing through the dog's stomach 2000 litres of water, acidulating the same with hydrochloric acid, and determining its degree of digestive activity.

More recently, Georges has demonstrated that the use of pepsin is absolutely valueless in cases of insufficiency of the gastric glands. The wines of pepsin, papain, and pancreatin, either with or without hydrochloric acid, are, according to Debove and Reymond, valueless to supply a deficiency of pepsin formed by the glands in the stomach. My own observations agree exactly with those of the authorities mentioned, in this respect.

After having employed pepsin for many years, on the strength of authority, I have now abandoned its use altogether, along with other digestive ferments, with the exception of malt, having been utterly unable to see any good results whatever from their use. What the stomach requires in cases of inactivity of the gastric glands, is, not a substitute for the normal product of these glands, but an increase of the activity of the glands. Peptogens are needed rather than peptones, peptonoids, or pepsins. Proteid substances are the best of all peptogens. The natural flavors of foods and the dextrin developed by the action of the saliva upon starch are also peptogens of the highest value. The fact last mentioned furnishes another plea for the use of dry foods by dyspeptics, thus securing thorough mastication.

In an experiment which I made to determine this point, it was found that the quantity of hydrochloric acid present in the stomach fluid after a well-masticated meal, consisting of water biscuit and water, was nearly double (or an increase from .028 to .05 milligrams per 100 c.c. of stomach fluid) that obtained after a test meal which was not masticated, from which it appears that thorough mastication encourages the production of HCl, as well as pepsin.

One of the very best of all peptogens is gluten. Eggs and milk are also peptogenic substances of value, particularly eggs. The peptogenic power of gluten is well shown in the following cases:—

After an ordinary test meal the amount of free HCl was found to be .046 per 100 c. c. of stomach fluid; the amount of combined chlorin, .232. In a test meal consisting of one ounce of water crackers

eaten dry, and one ounce of gluten mixed with water and swallowed directly afterward, the amount of HCl was found to be .064 per 100 c. c., and combined chlorin, .284, or an increase of forty per cent. In another instance the amount of free HCl was increased from .036 to .130, or 266 per cent., and the total acidity was increased from .260 to .354.

In a second meal, consisting of one ounce of pure gluten well chewed, dry, and eight ounces of water swallowed afterward, the total acidity was increased from .260 to .398, the combined chlorin from .216 to .294, and the free HCl from .036 to .046. No better evidence of the peptogenic properties of gluten could be asked for.

The popular idea that pepper, mustard, and similar substances increase digestive vigor has been shown by experiments to be erroneous. These substances, like common salt in excess, increase the flow of mucus without increasing the production of pepsin or hydrochloric acid. The production of pepsin and hydrochloric acid can be increased only by natural stimuli; that is, the peptogenic substances which nature puts into our food. These consist: (1) Of proteid substances which are intended to be digested by the action of pepsin and hydrochloric acid; (2) Of dextrin, the substance which naturally precedes peptone in the order of production in the digestive process; and, (3) Of food-flavors which by their reflex action increase the activity of all the digestive glands, as a preparation for the digestive act.

The secretion produced by mustard, pepper, pepper-sauce, and similar substances is for protective purposes only, the stomach pouring out a quantity of mucus which is spread over the mucous surface to protect it from the action of these abnormal and irritating substances. Alcohol, which has been supposed to be so beneficial to digestion, my experiments show to be equally destructive and injurious. This is well shown by the following experiments: —

The subject was a young man aged nineteen years. The analysis of stomach fluid, with the usual test breakfast and without brandy, gave the figures shown in the following comparative table, which relate to the number of milligrams of chlorin expressed in HCl found in 100 c.c. of filtered stomach liquid: —

| | Usual Test Breakfast. | Usual Test Breakfast with 4 oz. of Claret. | Usual Test Breakfast with 2 oz. of Brandy. |
|---|---|---|---|
| | grms. | grms. | grms. |
| Total acidity..... | .240 | .086 | .016 |
| Total chlorin..... | .328 | .216 | .306 |
| Free HCl..... | .032 | .000 | .000 |
| Combined chlorin. | .268 | .120 | .034 |
| Fixed chlorin..... | .098 | .116 | .172 |
| Coefficient..... | .77 | .72 | .47 |

Peptones and propeptones were found to be notably diminished in proportion to the syntonin in the stomach fluid containing brandy.

These experiments were repeated upon different persons, and with alcohol in different forms, as gin, brandy, wine, etc., the quantities being made such that the same amount of alcohol, about one ounce, should be taken in each case; and the results were found to be practically uniform, and essentially the same as have been given above. The accompanying comparative table shows very clearly the great diminution in the chemical activity of the stomach produced by alcohol. By a careful study of the table, it will be noticed that the young man who was the subject of the experiment had a more than normally active digestion. There is no excess of free hydrochloric acid, but an unusually large amount of combined chlorin, indicating what might be considered a physiological hyperpepsia, since the quality of the work done was but slightly below the normal standard, as shown by the value of the coefficient *a*. Four ounces of claret caused the complete disappearance of the free HCl, diminished the combined chlorin more than fifty per cent., and also diminished the quality of the digestive work done. The test made with the two ounces of brandy shows almost a complete paralyzing of the stomach, or apepsia. The free HCl disappeared entirely; and the combined chlorin, representing the useful stomach work, was reduced to .034, or one eighth the amount done under normal conditions. This influence upon the digestion is exactly what would be expected of a drug like alcohol, which is a paralyzer of protoplasmic activity, an anesthetic, and a sedative, not a stimulant, as has been erroneously supposed. It should be added that each preparation of alcohol was diluted with water, so as to make exactly eight ounces of fluid in each case.

(To be concluded.)

# FORMALIN AS A HARDENING AGENT FOR NERVE TISSUES.*

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FORMOL, formalin, or formaldehyde, was discovered by A. W. Hoffman in 1863 while passing wood spirit and air over a red-hot platinum spiral. If the vapor is brought into water to its point of saturation, a forty per cent. solution of formaldehyde is obtained, which has long been known under the name of formol. The knowledge that formalin possesses antiseptic as well as hardening powers we owe to the researches of Dr. F. Blum, and these facts induced the elder Blum to make an extended series of investigations in the hardening of animal and vegetable tissues in the Senckenbergischen Institute at Frankfort, Germany. His preliminary report was published in the *Zoölogischer Anzeiger*, 1893, No. 434, and a more detailed report in the *Berichte über die Senckenbergische Naturforscher Gesellschaft*, 1894, p. 195. Here he details his experience, which, in brief, is as follows: Several human embryos were finely preserved in formol diluted with ten to twenty parts of water. Small embryos with amnion intact were preserved, and the amniotic fluid remained transparent, so that the structural parts of the fetus and the umbilical cord were recognizable. The mouse, hamster, and porpoise were nicely preserved, the hair firmly in place, and the eyes in better condition than under the use of alcohol. Reptiles, fishes, and amphibians were nicely hardened in one to ten, one to twenty, or one to thirty solutions, according to the size of the object. The fishes retained in great part their color, while the slime and mucus covering them was rendered transparent. Of the invertebrates, snails, jelly fishes, insects, spiders, etc., all were well preserved.

Of the various animal tissues, the muscles and the brain were quickly hardened, retaining the coloring matter of the blood in the muscles, while in the brain the differentiation between the white and gray matter was very evident. Fruits, flowers, and vegetables of various kinds were preserved with equal success, the coloring matter being very little, if at all impaired. Blum's conclusions regarding the hardening of animal tissues may be summed up as follows: —

Animal objects are hardened without shrinking, and without losing their microscopic structure or staining properties.

The natural form and color are preserved.

The eye remains much clearer than in alcohol.

The mucus of slime-producing animals is not coagulated, and remains transparent.

The coloring matter of blood in tissues apparently disappears, but may be quickly restored by a high per cent. alcohol.

These experiments of Blum were path-making, and were quickly followed by those of Born[1], Pintner[2], Krückmann[3], Kenyon, Sadebeck, Mayers[4], and others with seemingly favorable results as regards the preserving and hardening powers of this compound. Besides these qualities, it is especially valuable because of its being non-poisonous, non-combustible, of a low freezing point, and (what to scientists is quite a serious question) very cheap.

My attention was directed to this substance about one year ago, through experiments made at the laboratory of the Erie County Hospital by my interne, Dr. Helvie.

Various tissues, as of the liver, spleen, placenta, lungs, heart, muscles, and other organs, were satisfactorily hardened and preserved. Especially gratifying were the results obtained with the umbilical cord and other myxomatous tissues. Instead of shriveling up and becoming opaque, as is the case when alcohol is employed, the cord retained its normal size, and was transparent and hardened to such a degree that sections were easily and perfectly cut with the microtome. The intestines were greatly shriveled during hardening, but otherwise were a success.

These results induced me to try its virtues upon the brain and spinal cord, and especially to find the earliest time

* Read at the eighteenth annual meeting of the American Microscopical Society, Cornell University, Ithaca, N. Y., Aug. 22, 1895.

1 Med. Sect. d. Schlesisch, *Gesellsch. f. Vaterl Kultur.*, 1894.
2 *Ver. Zool. Gesell.*, Wien, 1894, p. 8.
3 *Centralbl. f. Bakteriol und Parasitenk.*, 1894, pp. 851-57.
4 *American Naturalist*, Jan. 1, 1894.

when a spinal cord so hardened could be imbedded in celloidin and sections cut for staining and mounting. A spinal cord which to all appearance was normal, was cut in pieces about one centimeter long, and sections of the cervical, thoracic, and lumbar regions placed in bottles containing a five per cent., ten per cent., twenty per cent., and twenty-five per cent. solution of formalin. At the end of seven days a section of the cord was taken from each of these solutions and imbedded in celloidin, then placed on the microtome. The cord was evidently too imperfectly hardened, as no good cuts were obtained.

At the end of fourteen days the same procedure was followed, likewise on the twenty-first and the twenty-eighth days. At each of these intervals excellent cut were obtained; the cord retained its external contour and appearance, but the differentiation between the white and the gray matter was not as well marked as when alcohol is used. These sections took the carmine stains nicely, but less so the nigrosin, Pal, and Weigert stains.

The most serious action of the formalin on all of these sections was a contraction, evidently of the neuroglia in various regions of the cord, especially of the white matter, resulting in the formation of open spaces, or cavities. In the sections hardened in the ten per cent. solution, these cavities were so large as to destroy completely the slides for microscopical purposes. In the fifteen per cent. cord, the cavities were much smaller, but far more numerous, and the dorsal white columns looked like a honeycomb or sieve. This action of the formalin was manifested in every section examined, and is therefore not of accidental, but of regular, occurrence.

The drawback of the formalin in preventing the employment of the Pal and Weigert methods of staining has been successfully overcome by Marcus,[1] who, after hardening the cord from two to four weeks in a one-half per cent. solution of formalin, places small portions one-half centimeter thick in Müller's fluid in a brood oven for seven days at a temperature of 37° C. They are then dehydrated, imbedded, and the cuts again placed in Müller's fluid, from two to seven days in a brood oven, quickly washed in alcohol, then transferred into the Weigert stain.

1 *Neurologisches Centralblatt*, Jan. 1, 1895.

The action of the formalin on the ganglion cells is a happy one, swelling them, and rendering their nuclei susceptible to very intense staining.

The action of formalin on the brain has given very fine results. Born succeeded in hardening the entire brain very quickly for demonstrations, also small particles for microscopical purposes. I have been equally successful, and have some excellent specimens, nicely hardened. I have not as yet tried any of the staining methods on brains thus hardened, and cannot state what the results would be, although I have some specimens under way. From my experience with formalin, I can highly recommend it for the hardening of the various organs and tissues for macroscopic as well as microscopic purposes, but would still cling to the Müller solution for hardening the spinal cord, even if the time required for hardening be much longer than when formalin is used.

## ON THE FLAGELLA OF MOTILE BACTERIA.*

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DURING the past three years several new methods for demonstrating flagella have been announced. Up to the present time, however, a perfectly satisfactory process has not been devised, and the results obtained by different workers have been in many instances quite contradictory. The efforts to fix upon the flagella specific characters have also failed, although much advance has been made in that direction.

Notwithstanding the somewhat definite results which have been obtained in reference to the structure of the flagella, it appears to be of the highest importance that their nature should be more fully determined before they are accepted as constant and integral parts in the morphology of individual bacteria. The examination of a large number of preparations stained by the same method, and frequently a single specimen, will reveal quite different appearances. In some instances, and in my experience on a large majority

* Abstract of a paper read at the eighteenth annual meeting of the American Microscopical Society, Ithaca, N. Y., Aug. 22, 1895.

of the bacilli, the flagella appear as appendages radiating from the body (nucleus according to Bütschli) of the organism. I have occasionally observed a narrow unstained or more feebly tinted band separating the body of the organism from a deeply stained ring of which the flagella appeared to be projections. This capsule-like appearance has been illustrated by several observers. Bütschli, Zettnow, and others hold that the part of the bacillus which is easily brought out by the ordinary staining methods is the nucleus only, and that the additional portion of the organism demonstrated by Löffler's method is plasma, which surrounds the nucleus. Haeckle, on the other hand, states that they have no nuclei. For this and other reasons he refers bacteria to the animal kingdom, placing them in the first class of Achezoa.

Farrier has recently published a series of interesting experiences in which he shows that flagella on a single species of bacteria — as determined by the study of several forms — are subject to variations according to the conditions under which the organism is cultivated. Thus he found that the bacillus coli communis, cultivated at the temperature of the body, possessed several flagella, but when grown at a much higher temperature (46° C. maximum temperature for this bacillus), flagella could not be detected. If grown at 44° C., a few of the individual bacteria possessed these appendages. The age of the culture and the presence of a non-fatal quantity of an antiseptic in the culture media were likewise found to have appreciable effects. He states that this pleomorphism is due to their protoplasmic nature; the hypothesis assumed being that when the bacteria are subjected to degenerative agencies, such as high temperatures or antiseptics, the plasma contracts in a ball-shaped mass (presumably about the organism); but under favorable conditions, the plasma resumes its motile form.

Accepting this explanation, it is difficult to understand why the motile bacteria possessed of capsules such as micrococcus lanceolatus are not, under certain conditions, motile, or why the methods employed satisfactorily in staining the capsule will not act as well in bringing out the flagella. I have tried repeatedly to stain the flagella after these methods, more particularly the one used by Professor Welch in staining the capsule on micrococcus lanceolatus, but invariably the results have been negative. Why there should be such a marked difference between the motile and non-motile forms in the reaction of the "capsular" plasma to staining fluid, has not yet been explained.

I have sought for an explanation of the structure of the flagella-producing substance in the cilia or flagella of the zoöspores found in certain of the fungi, but thus far my efforts have not been rewarded, although much assistance may be obtained from a study of those forms. It is quite probable that certain phenomena, especially in reference to the free flagella and rings and hooks, may be explained by the same theories as those of zoöspores.

There are two views as to the disposition of the flagella of swarm spores. One is, that they are cast off, and the other, that they are absorbed into the body of the spore. Rothert shows, in a recent article, that both views are correct. "In the second swarm stage of saprolegnia and in the peronosporeæ, the flagella are either cast off as soon as the spores come to rest, or soon after, or else they remain attached to the spore indefinitely, even after germination. In the first swarm stage of saprolegnia, however, he found, to his surprise, that they are uniformly drawn back into the body of the protoplasm, the withdrawal being slow at first, and then quite rapid. The loops are formed either while the flagella are attached to the spores, or after they are cast off." He suggests that the flagella are formed of special cytoplasm existing only in small quantities. There is a close resemblance between the flagella of bacteria and those of the swarm spores.

The observations of Stoklin and Bunge, that several bacilli are sometimes included within the same capsule from the periphery of which flagella radiate, is exceedingly interesting. This phenomenon is explained in two ways: one is, that the surrounding plasma of two or more bacilli runs together, thus enclosing the bacilli in a common capsule; and the other is that the variable number of bacilli included within the same capsule is due to the multiplication of the organisms within the capsule. These observations strengthen the hypothesis that bacteria have nuclei and surrounding plasma.

# TRANSLATIONS AND ABSTRACTS

[THE articles in this department are prepared expressly for this journal.]

## HOT WATER IN SURGERY.

AT the last Surgical Congress, M. Reclus (*La Presse Medicale*) stated that he never amputates a crushed limb, no matter how great may be the extent of the injury. He envelops the limb with antiseptic gauze, and allows nature to separate the living from the dead tissues. But this method is possible only by the aid of hot water, which may be employed in the following manner: —

After disinfection of the injured part, the patient, who is nearly always in a state of traumatic shock, is surrounded by hot blankets, and the wound is laved with hot water at 60° to 62° C. (140° to 144° F.) An irrigator is employed, the vessel containing the water being at such an elevation as to produce a strong jet. A jet of hot water should fall upon every portion of the injured surface. It is only by this means that all clots, micro-organisms, and foreign particles can be removed. The hot water has a triple advantage: —

1. The high temperature is truly antiseptic.

2. It is hemostatic, and under its influence the hemorrhage is arrested.

3. It antagonizes the traumatic shock resulting from loss of blood.

Another indication for the employment of hot water in surgery is in cases of hemorrhoids in which a radical operation is declined. Whenever an acute attack occurs, there should be applied to the anal region compresses of tarlatan or cheesecloth moistened in water at 55° C. (131° F.). The compress rapidly cools, and should be renewed every minute, being applied as quickly as possible after heating by dipping in hot water. The patient should take, every morning, an enema of hot water at the same temperature. If the hemorrhoids are of recent development, and small in size, with no marked contraction of the sphincter or varicose masses of appreciable size, the hot water will relieve these attacks to such a degree that the amelioration will amount to a cure.

Hot water, according to M. Reclus, is truly a sovereign remedy in the treatment of acute prostatitis. The technique is as simple as possible. An irrigating-tube is carefully and slowly introduced into the anus so as not to injure the swollen prostate which obstructs the rectum, and water is applied at a temperature of 55° to 60° C. (131° to 140° F.). The water should be admitted very slowly. This application should be made twice a day until a cure is effected. The relief is almost immediate, and nine cases are given by M. Reclus in which there has been no suppuration.

[I have made use of a special form of irrigator for application of hot water to the rectum for many years, which I find much more convenient than the ordinary rectal tube. It consists of a tube furnished with a bulbous extremity perforated with small openings through which the water passes into the rectum. This tube is placed inside a larger tube, or sleeve, through which the water escapes from the rectum. This irrigator is made of hard rubber. It is illustrated in the accompanying cut. — J. H. K.]

The same treatment also gives excellent results in prostatic congestion, and M. Reclus has seen a hot enema relieve the retention of urine which is brought on in patients suffering from enlarged prostate by the slightest excess of fatigue or exposure to cold.

In salpingo-ovaritis, M. Reclus proceeds as follows: "The uterine cavity is disinfected and thoroughly drained, and enemata of hot water are daily administered. The best time for the enema is in the morning half an hour after rising." M. Reclus has seen many cases of perimetro-salpingitis recover under this treatment.

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**Prostatic Hypertrophy in Castration.**— Professor Englisch presented, at a recent meeting of the Imperio-Royal Medical Society of Vienna, the following interesting summary of our knowledge

upon this subject, and the relations of the testicles to the prostate: —

"That a relationship exists between the testes and the prostate is amply demonstrated by the parallel development of these organs. In cases of absence of the testicles, the prostate is also missing; and when only one testicle exists, the prostate is invariably less developed on the side where the defect is. In eunuchs the prostate is very much reduced in size. When the testicles are removed in young dogs, the development of the prostate is arrested, while the same operation performed on an adult animal results in atrophy of this organ.

"On these facts the treatment of prostatic hypertrophy by castration is based. To arrive at a correct estimate of the value of this operation, we must consider its influence both on the prostate and on the disturbances of the urinary apparatus. Of one hundred and two cases of castration, the effect on both was favorable in sixty-eight; in thirty-two cases there was no perceptible effect on the prostate, but considerable improvement of the urinary disturbances; in two cases the prostate decreased in size without any change in the urinary disturbances. Of the total number of cases, ninety-six were kept under observation for some time, and in thirty-seven of these, recovery was maintained, whereas in the other fifty-nine there was only ephemeral improvement. In no other method of treatment hitherto employed have the results been equally satisfactory. Spontaneous micturition was established in the majority of cases in a very short time."

**Abdominal Section for Visceral Prolapse.**— Treves reports in the *British Medical Journal* a case in which he performed abdominal section for the purpose of restoring the stomach and liver to their normal position, which he accomplished by suturing the liver to the abdominal wound. The result was a complete recovery, and the patient is now enjoying excellent health.

**Rheumatism and Appendicitis.**— Dr. Beverly Robinson, of New York, recently argued in the New York *Medical Record* that there is an intimate relation between acute rheumatism and appendicitis. He has frequently noted symptoms of rheumatism in persons who have had several attacks of appendicitis. This clinical observation of Dr. Robinson's entirely agrees with the researches of one of Pasteur's assistants published a year or two ago in the *Annals of the Pasteur Institute*, which show the close relation between intestinal catarrh and rheumatism. He demonstrated that catarrh in these cases is due to a specific microbe, which forms colonies on the mucous membrane in the intestine. That there is a close relation between appendicitis and intestinal catarrh was long ago very clearly established.

**Cause of the Increase of Cancer.**— Dr. W. Allan Jamieson, F. R. C. P., physician for diseases of the skin at the Edinburgh Royal Infirmary, in discussing the causes of these diseases, calls attention to the fact that the frequency of cancer has greatly increased within the last fifty years, an opinion with which Mr. Christopher Heath, an eminent English surgeon, also agrees. The author expresses the belief that the increase in the consumption of butcher's meat, and especially the extensive use of beef, are causes of this great prevalence of cancer in modern times. Dr. Burney Yeo is quoted as declaring that "among other evils attending an animal dietary, one is, that it favors the tendency, where it exists, to the development of cancer." The excessive use of meat is also considered to be a cause of eczema.

**The Medicated Douche for Vaginal Catarrh.**— According to M. Straussmann, there are two forms of vaginal catarrh: —

1. A variety which may be termed dry catarrh, or seborrhea of the vagina, chiefly observed in old or fleshy women, or during pregnancy, characterized by a profuse white discharge. This form of the disease rapidly disappears under the use of alkaline injections, as for example, two teaspoonfuls of soda to the quart of water. The alkali doubtless acts in neutralizing the unusual acidity of the vaginal secretions. Alum should never be employed in these cases; its use is decidedly contra-indicated, and is often harmful.

2. A simply muco-purulent catarrh of the vagina, chiefly observed in young women,

sometimes as the result of the irritation of ascarides. In this form of the disease excellent results may be obtained by the use of vinegar in the proportion of four teaspoonfuls to a quart of water. Sulphate of zinc, in the proportion of a dram to a quart, may also be employed with advantage.

In gonorrhea, the treatment must differ according to the location of the infection. Sometimes the urethra is the chief seat of the disease, in which case the patient should rest in bed. The parts should be bathed in a one per cent. solution of sulphate of zinc. In cases in which the neck of the womb has become infected, it should be carefully cleansed daily, and a vaginal tampon, moistened with a solution of corrosive sublimate, one part to one thousand, should be applied. The pledget should be held in place by another vaginal tampon saturated in glycerin containing three to five per cent. of iodoform. This method of treatment relieves the pain and itching.

The granular vaginitis which sometimes appears some weeks after infection, should be treated by weak antiseptic solutions. Solveol, one or two teaspoonfuls to a quart of water, is much less caustic and less toxic than phenic acid.

**Creosote Enema.**— Annequin, of the hospital at Grenoble, France, employs milk as a vehicle for creosote administered by the rectum, first adding creosote to milk in the proportion of one part to twenty, and then adding two hundred and fifty parts of boiling water. When shaken together, these constituents form a perfectly milk-white emulsion. Used in this way, creosote is the best of all medicinal agents that can be employed in the treatment of consumption.

**Iodine Vaginal Douche.**— M. Romme (*La Presse Medicale*) recommends, as the best of all medicated solutions for vaginal injection, tincture of iodine in the proportion of one teaspoonful to a quart of hot water. M. Romme is much opposed to the use of the ordinary antiseptics, because of the fact that they harden the epithelium, and thus increase the danger of absorption. This objection appears to apply to bichloride of mercury, permanganate of potash, and sulphate of copper, all of which substances, although excellent antiseptics, harden the epithelium to a marked degree.

**New Application of Tendon Grafting.**— An American surgeon, Milliken, has found a method of curing the deformity resulting from infantile paralysis, by attaching, by means of sutures, the tendon of a paralyzed muscle to the tendon of a muscle not affected by disease.

**Maunsell's Method of Intestinal Anastomosis.**— Dr. Wiggin, of New York, has done the profession a favor in describing Maunsell's method of intestinal anastomosis, which offers an advantage over all others, in that it is a ready method, requiring no special appliances. The most essential point in the method is the making of an incision a short distance above the divided end of one section of the intestine, through which the two ends are made to protrude, thus presenting themselves in the most convenient position possible for careful suturing, being afterward pulled back, and the slit closed. The *New York Medical Journal* for Dec. 14, 1895, contains an article describing the operation, which is illustrated by a number of very good cuts.

**The Echinococcus in the United States.**— This disease, which has heretofore been considered rare in this country, is due to infection of the body by the embryos of a species of tapeworm. In the case of this parasite, man stands in the same relation to some other animal as does the ox to man in the case of the common tapeworm. Dr. de Solis-Cohen, in a recently published note, calls attention to the fact that this disease is no longer so rare as formerly, but is increasing, a fact which is true of all other forms of parasitic disease due to the close association of man and domestic animals.

**Objections to a Milk Diet in Typhoid Fever.**— We are glad to note that so eminent an authority as Professor DaCosta has called attention to the fact that an exclusive milk diet is a source of mischief rather than benefit in typhoid fever. The white of egg, dissolved in water, has

been recommended in the place of milk, which often produces disturbance by the formation of curds in the stomach. These do not digest, but undergo decay, and produce ptomains, which, being absorbed, increase the fever and also the coat upon the tongue, as well as tympanites and other bowel symptoms.

**Chlorin for Pruritus Ani.**— Dr Berger, a Russian physician, recommends the application of chlorid of lime in pruritus ani. A piece of cotton-wool is soaked in a strong solution of ordinary chlorid of lime and introduced into the anus. As soon as a slight burning or smarting is experienced, the cotton plug is removed, and the anal region, internal and external, washed with the solution, and afterward left to dry spontaneously. This method is said to remove the itching very quickly, after which the eczema and swelling soon disappear.

**Treatment of Hydrocele by Injection of a Solution of Iodoform in Ether.**— The method is very simple. The fluid is withdrawn by an ordinary exploring syringe. Leaving the needle in place, the syringe is filled with a ten per cent. solution of iodoform and ether. The syringe being connected with the needle again, this solution, to the amount of forty-five to one hundred and twenty minims, is injected in such a manner that it may come in contact with the whole of the sac. The injection should be made as quickly as possible, so that the ether will not become overheated. After coming in contact with the tissues, the ether boils, and diffuses the iodoform throughout the whole sac. There is but little pain, and the operation is very effective.

**Hot-Air Baths in Dropsy and Anemia.**— Dr. K. Dehio (*Medical Week*) recommends hot-air baths taken in bed as of great value in many diseases, particularly in dropsy and grave anemia. The bath is given by a very simple device by which sheets are supported over the patient while the bath is administered. In such a bath the temperature usually rises to 38.5° C. (100.4 F.), seldom to 39° C. (102° F.). The quantity of perspiration produced in a bath of two-hours' duration at a temperature of 45° to 50° C. (113° to 115° F.) may amount to one or two quarts. A hot-air bath also diminishes the amount of urea and uric acid eliminated by the kidneys.

The hot-air bath is especially useful in cases of dropsy from disease of the kidneys. It has a powerful diuretic as well as diaphoretic effect. The effects of the hot-air bath are usually unfavorable in dropsy occurring from disease of the heart, although sometimes useful even in these cases. The translator has found the electric-light bath much more effective for each of these purposes than the vapor or hot-air bath.

**A Weak Solution of Nitrate of Silver for Hemorrhoids and Anal Fissure.**— M. Schmey reports the cure of many cases by the daily application of a two per cent. solution of nitrate of silver. In one case, hemorrhoid nodules entirely disappeared after eight applications. A case of extreme anal fissure recovered in the same length of time under this method.

**Compulsory Notification in Rheumatic Fever.**—Dr. Newsholme, of Brighton, England, urges the importance of recognizing, not only tuberculosis, but also rheumatic fever, among the infective diseases in which notification should be compulsory. In Norway and Denmark this is done. On the returns from these two countries he bases the conclusion that rheumatic fever occurs in great epidemics, sometimes assuming pandemic proportions. The dry seasons, especially when there has been a succession of such seasons, producing a low ground water and an exceptionally high ground temperature, seem most favorable for such outbreaks.

**Influence of Fatigue upon the Hearing.**— A striking illustration of the influence of fatigue upon the nervous system is afforded by an experiment conducted by an Italian physician some months ago. Twenty-four bicycle riders who had ridden thirty-two miles in two hours and a quarter were examined with reference to their hearing, and it was in nearly every instance found to be defective. After two hours' rest, the hearing had become normal in most of them.

# BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE AND BACTERIOLOGICAL REVIEW, from original sources.]

**Method of Demonstrating Protozoa and Spirilla in Drinking-Water.**— The method is as follows: An ordinary brown bean is placed at the bottom of a test-tube, which is then filled nearly full with distilled water, and kept upright at the temperature of the room, as free from currents of air as possible. Water, with the oxygen it contains, is taken up by the bean, and certain soluble substances (including sugar and phosphates) diffuse from the latter into the water, serving as nutriment for the bacteria. In the first place, the organisms upon the surface of the bean develop, producing a cloudiness over its surface. This cloud of developing organisms soon rises, however, owing to the rapid removal of oxygen from the neighborhood of the bean. The level attained by the dense mass depends on the time which has elapsed since the experiment began, and upon the temperature. In the case now quoted, in forty-eight hours, at 20° C., the collection of organisms was seen at a point two to three cm. above the bean, as a thin, opaque layer (the "bacterial level"), which appeared as a sharp line when viewed from the side. Above and below this, the water was clear. The "level" is that point at which the oxygen from above and the nutrient stream from below meet, and afford suitable conditions of growth for the bacteria.

In place of the bean, sterilized nutrient agar, or gelatin, may be used. This, after setting, is inoculated with the material to be examined, and sterilized water is then poured over it. The water may be thickened with agar (one per cent.). The bacterial level forms as before, with certain distinctions. The special advantage of this method is that it realizes all possible conditions in respect of concentration of nutrient material and oxygen. Hence, it is very suitable for the study of protozoa and spirilla. Some of the water to be examined is poured into a tube, at the bottom of which is the solid gelatin, or agar. A "level" presently forms, containing various bacteria. The water above this is suitable for the development of protozoa, owing to a combination of the following conditions: A low proportion of organic material (which has been largely filtered off at the bacterial level), a high proportion of bacteria (which serve as food), and variations within wide limits of the same amount of contained oxygen. In samples of this water the protozoa can be well studied. Presently the surface of the water becomes covered with a thick layer of bacteria and monads, and the entry of oxygen is consequently much hindered. Spirilla now develop, forming a "level." Beyerinck gives the results of examination of a specimen of drinking-water by this method. He shows that the protozoa and spirilla therein contained existed in the water at the time of collection, and had not merely gained access to it from the air of the laboratory. In conclusion, certain modifications are pointed out by which the method may be adapted for wide application.— *American Medico-Surgical Bulletin.*

**Destruction of Microbes in Sponges.**— Sponges cannot be disinfected by heat, as they are damaged by a temperature of 60° to 80° C. (140° to 176° F.). The effect of heat is to reduce the size of the sponge, to diminish its elasticity, to reduce its absorbent power, and to otherwise injure it. It can only be rendered free from germs by means of antiseptic germicidal solutions; it should be immersed one or two weeks before being used. Carbolic acid, one part to twenty parts of water, is the most satisfactory antiseptic solution for this purpose.

**Disappearance of Microbes from the Nose.**— Thomson and Hewlett, of the British Institute of Preventive Medicine, have recently published an abstract of a paper detailing work done by them in the bacteriological department of the Institute, for the purpose of determining the fate of the micro-organisms of inspired air. The abstract is as follows:—

"In a communication we recently had the honor of reading before the Royal Medical and Chirurgical Society on 'Micro-organisms in the Healthy Nose,' we estimated that at least 1500 organisms are inspired every hour, while it must be a common event for this number to rise to

14,000. In spite, however of the enormous number of organisms inspired, numerous observers have shown that expired air is practically free from microbes (Tyndall, Gunning, Strauss). In the experiments of Strauss, of 609 microbes inhaled, only a single one was expired. Lister's observations on pneumothorax caused by a wound of the lung by a fractured rib seem to show that the organisms are arrested before they reach the air cells; while the experiments of Hildebrandt indicated that this arrest takes place before the trachea is reached, probably in the nasal cavities. This seems to be the case, for we have examined bacteriologically the tracheal mucus from many recently killed animals, and have always found it sterile. In our paper referred to above, we arrived at the conclusion that the mucous membrane of the normal nose seems to be usually quite free from micro-organisms, while the vestibules, vibrissæ, and crusts are swarming with them. If, then, the bacteria in inspired air are arrested in the nasal cavities, what becomes of them? and how are they gotten rid of? That the action of the ciliated epithelium is an important factor can hardly be doubted, for any particles deposited on a ciliated epithelial surface are rapidly moved onward, as can be demonstrated by watching the movement of a particle of wet cork placed on the dorsal wall of a frog's pharynx.

"The following experiment shows that bacteria deposited on the Schneiderian membrane are rapidly removed. Cultures were prepared from the vibrissæ and mucous lining of the nose of one of us, who acted as the subject. No red growth developed in these, so that the bacillus prodigiosus was absent. A looped needleful of a pure culture of the bacillus prodigiosus was then deposited on a spot on the septum naris, and cultures were made from this spot and its neighborhood at intervals up to two hours. Cultures made within five minutes gave an abundant confluent growth of bacillus prodigiosus; after fifteen minutes the amount of growth was distinctly decreased; after sixty minutes the growth was diminished by seventy-five per cent.; after eighty minutes practically no growth occurred; while after two hours no trace of the bacillus prodigiosus could ever be detected.

"Wurtz and Lermoyez have stated that the nasal mucus exerts a bactericidal action, but so far we have been unable to confirm their researches.

"We have made a number of experiments to test the bacterial condition of the air before and after passing through the nose. Our first experiments were very conflicting, but having perfected our methods, our later ones show that nearly all the organisms are arrested before reaching the naso-pharynx.

"We conclude that many of the organisms are arrested by the moist meshwork of the vibrissæ, while those which reach the mucous membrane are eliminated by the action of the ciliated epithelium, and by the trickling of the mucus. The mucus, from our experiments, seems to be an unsuitable nutrient medium, and the multiplication of organisms is thereby prevented. Phagocytosis may occur, but only to a small extent."

Thomson and Hewlett agree with Hildebrandt, that the mucus found in the trachea is always sterile, all germs being arrested in the nasal cavity before the trachea is reached. The experiments made show that bacteria placed upon the membrane of the nose are rapidly removed. A quantity of bacillus prodigiosus was entirely removed within two hours.

These observers do not agree with Wurtz and Lermoyez that the nasal mucus destroys bacteria, but they do not state upon what grounds they base their disagreement, and do not furnish a sufficient explanation for the rapid disappearance of microbes from the nose.

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**A New Method of Examining Sputum for the Tubercle Bacillus.**—Spengler (*Deut. Med. Woch.*, 1895, No. 15) describes a new method for the preparation of sputum in which tubercle bacilli are suspected. He mixes equal volumes of sputum and warm water, rendered feebly alkaline with caustic soda, with 0.1 to 1.0 per cent. of trypsin, and then places the mixture in the incubator. Two or three hours later a small quantity of crystalline carbolic acid is added to prevent putrefaction. As soon as a deposit forms, the supernatant fluid is poured off, the deposit washed with fresh alkaline water, and again placed in the incubator. This process is repeated several times, and finally the sediment is collected upon a filter-paper and dried. Portions are then stained in the usual way.

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AND
BACTERIOLOGICAL REVIEW.

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BATTLE CREEK, MICH., MARCH, 1896.

## CONCENTRATED MILK.

A WRITER in the *British Medical Journal* has called attention to the value of concentrated milk in certain forms of diarrhea and in wasting disease, and especially in cases in which the patient is unable to take other nourishment, and cannot take a sufficient amount of milk in its ordinary, diluted form to meet the demands of the body. Concentrated milk is prepared by evaporating the milk in a porcelain dish over some suitable heating apparatus, care being taken to see that the liquid does not boil and to stir it continually. By this means cream is prevented from rising, and the evaporation is not delayed by the formation of a skum over the surface. With proper apparatus and attention, milk may be reduced to one half its volume in one hour.

## ANCIENT REMEDIES FOR EPILEPSY.

THE following extracts from an ancient medical work give something of an idea of the hardships to which our forefathers were exposed under the name of medical treatment:—

"*Against the Epilepsy.*— As soon as a child is born, and before it takes anything else, if you make it swallow half a scruple of coral in powder, mixed with nurse's milk, it is given for certain that the child will never be afflicted with epilepsy.

"*Another Remedy for the Same.*— Take some wheat flour, that you will mix with dew, gathered on the morning of St. John's day; make of it a cake, which being baked, give it to the patient, and he shall get well.

"*Another for the Same.*— If you cut and open, before the full moon, the young ones of the swallows of the first nest, you will find in their ventricle two small stones, one of which is all of one color, and the other of several colors; before they touch the ground, shut them up in a piece of goat or deer skin, and tie them on the arm and neck; they will cure the patient of the epilepsy, according to the testimony of an Italian doctor, who assures, having made the experiment with it.

"*To Know the Epilepsy.*— To know the epilepsy, burn some deer horns, and the person who is subject to it will fall, but the patient must be surrounded with a blanket or quilt from head to foot, in the manner of a pavilion, in order that the smoke does not get lost."

## CONTAGION THROUGH THE MEDIUM OF BOOKS.

THE December number of the *Annales de l' Institut Pasteur* contains an interesting paper by Cazal and Catrin, the purpose of which was to determine the following questions:—

1. Are books carriers of microbes, and especially of pathogenic microbes?

2. Can a book soiled by infectious liquids from a patient suffering from a contagious malady transmit the disease?

3. Is there a practical means by which books may be easily and completely disinfected?

The conclusions reached as the result of numerous experiments in relation to each of these questions were as follows:—

1. That books, even when absolutely new, are not aseptic, but that they do not present pathogenic microbes, the latter being found, however, in old books.

A curious fact noted is that an old book which had been used a long time by the patients of a great hospital, when examined, showed only a single pathogenic microbe, the staphylococcus pyogenes aureus.

2. In experiments relating to the communication of infectious diseases through the medium of books, positive results were obtained for the streptococcus, the pneumococcus, and the diphtheria bacillus, but the results were negative for tuberculosis and typhoid fever.

3. It was found that unbound books could be completely disinfected by exposure to dry heat, but bound books could not be thus disinfected without injury. For this reason it was advised that only unbound books and papers should be used in hospitals.

**Malaqua.**— Dr. Bachmann, according to the *Journal of the American Medical Association*, insists that the term *malaria* is incorrect, and he has coined a new word, *malaqua*, to take the place of this ancient misnomer. Dr. Bachmann argues that "unless we come in actual contact with the evidence produced in the use of pure water as against that heretofore used, the physician will, in all probability, be very slow to allow himself to be convinced that the word *malaria* (*mal*, bad; *aria*, air) is a misnomer, and that *malaqua* (*mal*, bad; *aqua*, water) is the word that should be used to cover the pernicious effects known under the name of malarial fever.

"The germ which is of soil origin, is strictly a protozoön, and reaches its highest development in low, moist ground with a favorable temperature. Surrounded by the proper soil conditions, this protozoön passes from one stage of life into another with considerable rapidity; so that in the present state of our experimental knowledge, it is impossible to identify it; nor is it probable that by culture we shall be able to produce the accepted Laveran germ outside of the human system.

"As a rule, the potable water from the malarial districts is derived from driven wells not over twenty-two feet deep, in soil with clay or some other impervious substrata, which water is generally cool and palatable, often sparklingly clear, but more frequently a little turbid. This water is filled with an incalculable number of these germs in all stages of development; and if used as a potable water, they naturally find their way into the system through the alimentary channel. This protozoön passes through so many forms or stages of life that in some stages it is light enough to float and be transported by the moist air of low grounds, but in this state it is comparatively harmless except under most extraordinary conditions; it is not until the surface water is used that the real mischief begins, when, by reason of higher development, it has become much more virulent than that floating in the air. A very short period of incubation is sufficient to develop a severe case of malarial fever in the newcomer who uses the surface water.

"From personal observation I know that the exclusive use of pure, deep-seated water affords entire immunity against malaria in sections of country where no white man dared live, using the surface water. Nor must it be understood that the exclusive use of pure water simply fortifies and strengthens the system against the attack of the germ. The water is the primary cause of infection, which acts as the direct carrier of the germ into the system through the intestinal tract."

**Chauncey M. Depew on Liquor-Drinking.**— Mr. Depew, who has perhaps the greatest reputation of any man in the United States as an after-dinner orator, but who has never posed as a temperance lecturer, recently related the following facts from his own personal observation: "Twenty-five years ago I

knew every man, woman, and child in Peekskill. I was up there last fall, and began to count them over. Some of them have become clerks, some merchants, some manufacturers; others have become lawyers and doctors. It is a remarkable fact that every one of those who drank, is dead; not one is living. Every one who proved a wreck, and ruined his family, did it because of rum. Every one who has been frugal, thrifty, industrious, and church-going, without exception, owns the house in which he lives."

**Nutritive Value of Corn-Meal.**— Professor Atwater, who has for many years been engaged in investigations relating to foods for the United States Department of Agriculture, has been led to the conclusion, as the result of exhaustive studies on the subject, that, considered from an economical standpoint, corn-meal has the highest nutritive value of all foods. Ten pounds of corn-meal contains more than eight pounds of actual nutriment, while the same quantity of potatoes possesses but three and three-fourths pounds of nutrient material.

We regret to note the recent announcement of the death of Dr. Robert Battey, of Rome, Ga. Dr. Battey obtained great distinction as a physician, especially in connection with the operation of ovariotomy. Though generally supposed to be a native of the Southern States, Dr. Battey was in fact a native of Michigan, being born in the town of Marshall, where he lived until he was a young man.

**Napoleon Defeated by a Bad Stomach.**— According to a recent writer, Napoleon owed his downfall to an attack of cramp in the stomach. When dictating an order to Vandamme, one of his principal generals, at a critical moment he suddenly stopped, uttered a sharp cry, doubled up like a pocket-knife, and was utterly unable to either think, speak, or act. His inability to put in operation the plan which he had conceived, gave rise to a train of mishaps, the last of which was his utter discomfiture and defeat.

**A Wise Law.**— The State of New York has a law compelling every city of over fifty thousand inhabitants to equip and maintain free public baths. Smaller towns are urged to raise money for the purpose, although not absolutely required to do so.

**Human Manikins.**—The *British Medical Journal* calls attention to the evils of cigarette-smoking and the use of tobacco in general upon boys and young men, and declares that schoolboys should be taught that premature indulgence in tobacco, whether in the form of cigarettes or any other, "is likely to make them grow up into manikins rather than men." This idea ought to be impressed upon the mind of every boy and young man in the land, and it ought also to be made clear to older men, that what is bad for a boy of twenty must be bad for a man of twenty-one, twenty-five, or a greater age.

**Avoid the Skins of Fruit.**— In the Laboratory of Hygiene of the Battle Creek Sanitarium an interesting experiment was recently made for the purpose of determining the influence of the skins of fruit. A young man in whose stomach fluid no microbes whatever were found after a breakfast of sterilized food, was given a quantity of unwashed grapes, which he ate, skins and all. Examination of the stomach fluid showed more than five hundred thousand microbes for each fluid ounce.

Dr. Maria Duncan calls attention to the fact that the bloom of the peach is a luxuriant growth of microbes, which find

in the stomach most favorable conditions for growth and development, thus causing decay of the fruit before it can be digested. This may be an explanation of the fact that many people cannot eat raw fruit. All raw fruit should be thoroughly washed before it is eaten, and the skin carefully removed in such a manner as to avoid soiling the flesh, or pulp, of the fruit.

**Medicinal Advertisements.**— At its last meeting, the trustees of the American Medical Association instructed the editor of the journal of the Association to accept no advertisements of medicinal preparations, the proprietors of which did not give a formula containing the official or chemic name of each composing ingredient, to be inserted as part of the advertisement. The Medical Society of the State of Pennsylvania, at its recent meeting, endorsed the action of the American Medical Association, and urges upon all journals to follow the example of the Journal of the American Medical Association, in which we heartily concur.

**A Sanitary Use for Cows' Horns.** —A sanitary argument can now be added to the humanitarian, against the cruel practice of dehorning cattle. The municipal authorities of Rome, Italy, have taken more advanced ground in relation to the protection of the people from infection with tuberculosis through the milk of diseased cows than has been taken by any other public authority. The sanitary regulations of the city of Rome for some time have required an inspection of all milch cows, and this sanitary surveillance has now been extended to the surrounding Campagna. When a cow has been inspected and found to be capable of furnishing good milk, the fact is indicated by a mark placed upon the animal's horns and a license issued to the owners of the animal. No milk except that produced by those inspected and licensed animals is allowed to be sold. The inspection is repeated every year. All cows suspected of tuberculosis are subjected to the tuberculin test described in these columns some months ago, and if found to be diseased, are destroyed. This practice is one which may be well commended to the attention of sanitary authorities everywhere.

# REVIEWS.

A NEW WORK ON THE STOMACH.— A Paris (France) publishing-house has recently issued a new work on the stomach, by Professor G. M. Debove, of the Hospital Andral, Paris, and Professor A. Rémond, of Metz. This work of 430 pages, entitled, "Traite des Maladies de L'Estomac," is the most important and valuable work upon the subject which has yet appeared. Being of a later date than the excellent treatise of Ewald, it presents the subject in the light of the most recent researches, and gives due prominence to the remarkable and interesting facts developed by Hayem and Winter in their painstaking study of the chemical processes of the stomach, which are barely mentioned by Ewald, an oversight for which there seems no other reason than national prejudice, a form of human weakness which scientific men generally manage to rise above. Upon this point, however, we must not speak too positively, as we certainly would not wish to treat unfairly a writer who has done so much in developing methods of precision in diagnosis and therapeutics as has Professor Ewald.

Debove and Rémond are evidently thoroughly familiar with the work of Ewald, as well as with that of all other modern investigators, and they have made their work a most admirable summary of what is known relative to the physiology and pathology of the stomach. The work has the merit of being accurate, precise, and thoroughly scientific, without being so laboriously and painfully technical as to be uninteresting and unnecessarily bulky.

The Modern Medicine Publishing Company have arranged with the editors and publishers for bringing out an English translation of this work, which is now being prepared, and will be issued in the near future. We believe it will be gladly welcomed by the profession everywhere.

# The Battle Creek Sanitarium
# LABORATORY OF HYGIENE.

J. H. KELLOGG, M. D., Superintendent.
GEO. W. BURLEIGH, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
A. B. OLSEN, B. S., M. D., Pathologist.
W. A. GEORGE, M. D., Chemist.

**Monthly Résumé of Work Done.**

## REPORT OF EXAMINATION OF BLOOD.

FOR FEBRUARY.

| Blood Count. | Men | Women. | Total |
|---|---|---|---|
| Over 5,000,000 | 6 | | 6 |
| Between 4,500,000 and 5,000,000 | 44 | 6 | 50 |
| " 3,500,000 " 4,500,000 | 20 | 64 | 84 |
| " 3,000,000 " 3,500,000 | | 2 | 2 |
| Less than 3,000,000 | | 1 | 1 |
| Totals | 70 | 73 | 143 |

| Hemoglobin. | Men. | Women. | Total. |
|---|---|---|---|
| 100 per cent | 32 | 11 | 43 |
| 93 " " | 21 | 35 | 56 |
| 85 " " | 9 | 21 | 30 |
| 78 " " | 5 | | 5 |
| 71 " " | 3 | 3 | 6 |
| 63 " " | | 2 | 2 |
| 28 " " | | 1 | 1 |
| Totals | 70 | 73 | 143 |

**Gastric Laboratory Report for February.**— Total number of examinations made, 129; experimental, 13.

Patients were received from the following States and countries: Michigan, 45; Ohio, 14; Indiana, 12; Illinois, 6; Iowa, 6; South Dakota, 6; Wisconsin, 4; West Virginia, 4; Nebraska, 3; Minnesota, 3; New York, 2; Pennsylvania, 2; South Carolina, 1; Missouri, 1; Kentucky, 1; Washington, 1; Maine, 1; Massachusetts, 1; California, 1; Switzerland, 1; South America, 1.

**Microscopical Examination of Sputum for February.**— There were 42 examinations made, 31 of which were new cases. Ten cases were found to be tubercular.

Patients were received from the following States: Michigan, 8; Indiana, 1; Kentucky, 1.

**Bacteriological Examination of Stomach Fluids.** — There have been 103 examinations made, 89 of which were new cases; 7 were repetitions and 7 experimental. In 17 cases the stomach was found to be sterile.

**Urinary Report for February.**— Number of specimens analyzed, 262; number of cases, 235; number of specimens in which albumin was found, 14; pus, 52; sugar, 8; blood, 4; bile, 2; casts were found 2; toxicities taken, 5; total nitrogens and xanth. worked out, 2.

# PUBLISHERS' DEPARTMENT.

A PHYSICIAN'S OPINION OF GRANOSE.— The following unsolicited testimonial was recently received from Dr. Geo. W. Green, of Battle Creek, Mich., formerly of the well-known firm of Chapman & Green, Manufacturing Pharmacists, Chicago, Ill.:—

"I want to thank some one for the 'Sanitarium Foods' which are produced from the food department of the Sanitarium. I think the thanks of the medical profession are due you for developing these foods. I, with many others who have led busy lives, find much difficulty in digesting starchy foods — they cause fermentation and bad assimilation, yet I cannot do entirely without starch in my diet. In Granola and Granose Flakes I find the starch so modified in your process of preparation, that the impairment of my digestion is entirely relieved. We shall, in the future, make daily use of these two preparations, and incidentally several other of your foods.

"One of the chief pleasures I have in using these preparations is that I believe them absolutely true to formula.

"GEO. W. GREEN, M. D.,

"*Battle Creek, Mich., June 3, 1895.*"

In the note accompanying the above testimonial, Dr. Green kindly says, "If the inclosed indorsement of your foods will be of any benefit to you, you may make use of it as you desire. This is the first time in my life I have ever indorsed anything, and this is entirely unsolicited. I thought the goods had earned anything I could say."

---

A FOOD CURE FOR CONSTIPATION.— Granose cures constipation. Hundreds of cases might be cited in which the free use of granose at each meal has resulted in the complete cure of chronic constipation of many years' standing. At the Battle Creek Sanitarium its use is one of the chief methods of controlling this very obstinate condition. It is found superior for this purpose to graham bread, cracked wheat, or any other of the whole-grain preparations, and has the additional advantage of not being irritating to the stomach or intestines, a fact which is due to the thorough manner in which the cellulose covering of the grain is broken up.

The use of granose is more than a complete substitute for mineral waters, after-dinner pills, and the various laxatives, liver tonics, etc., which are so largely used to regulate the bowels, and which produce serious disturbances of both the stomach and liver. The habitual use of laxatives is a most pernicious practise, and has ruined the health of thousands.

---

HOW TO MAKE FAT AND BLOOD.— Bromose and granose constitute an ideal diet for a person who wishes to make a rapid gain in fat and blood. A lady patient at the Battle Creek Sanitarium who had so bad a stomach she could not eat anything else, gained fourteen pounds in fourteen days by eating only bromose and granose. These foods cured her of chronic indigestion in three weeks.

---

AHEAD OF ALL COMPETITORS.— Granose is often digested when no other food can be retained by the stomach. It is invaluable in extreme cases of indigestion, and seems to be equally useful in hyperpepsia and hypopepsia. One reason why granose is so easy of digestion is, that it never becomes pasty, as do mushes and most other grain preparations. When moistened, it breaks up into exceedingly fine particles, but never forms viscid masses; hence it is very quickly dissolved by the saliva and the gastric juice, which act together upon the food in the stomach.

---


# Caramel-Cereal

**FOR THE LAST TWENTY YEARS,** has been used by the thousands of invalids who annually visit the great Sanitarium at Battle Creek, Mich.

**UNCONSCIOUS POISONING.**—An old physician of Chicago remarked the other day: "Thousands of people are poisoning themselves daily with tea and coffee without knowing it. A great number of nervous maladies, and indigestion in various forms, are the result of the deleterious effects of the poison of tea and coffee upon the system. I myself made the discovery a good many years ago, that the headaches from which I had suffered for years, were due to the use of tea and coffee. I found whenever I took a cup of strong coffee, I had a headache as the result, and I had headaches now and then in spite of what I considered my great moderation in the use of tea and coffee. I concluded to dispense with them altogether, and when I did so, my headaches disappeared and did not return. I have cured scores of chronic headaches by forbidding the use of tea and coffee."

**CARAMEL-CEREAL** is a perfect substitute for tea and coffee. It is aromatic, delicious to the taste, and so nearly resembles coffee as easily to be mistaken for veritable Mocha, although, of course, not by a connoisseur.

For illustrated catalogue and prices, address,

**BATTLE CREEK SANITARIUM HEALTH FOOD CO., Battle Creek, Mich.**

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## LYCETOL

An alkaline salt of Piperazine, possessing marked properties as a uric acid solvent, and highly commended in cases of gout and lithæmia.

## SALOPHEN

A non-toxic, agreeable and effective antirheumatic in acute and chronic cases, and a reliable analgesic in migraine and the neuralgias.

## PHENACETINE-BAYER

The safest, most efficient and reliable of antipyretics and analgesics for all acute, inflammatory, febrile conditions and all forms of pain.

## PIPERAZINE-BAYER

A uric acid solvent and antilithic of acknowledged value in lithæmia, acute and chronic gout, renal lithiasis and colic, and hematuria.

# SOMATOSE

**Somatose is a concentrated preparation of the nutrient elements of meat, in powder form, which is palatable, well relished, stimulates the appetite, and is readily assimilated. Recommended in fevers and wasting diseases, and as an adjunct in infant feeding**

## TANNIGEN

An active and innocuous intestinal astringent for diarrhœal affections, both acute and chronic, tasteless, and undecomposed in the stomach.

## ARISTOL

A convenient, unirritating and effective antiseptic dressing in general surgery, dentistry, gynecology, diseases of the eye, ear, nose, and in burns.

## EUROPHEN

A complete substitute for iodoform, non-toxic, agreeable, adhesive, and of especial value in minor surgery, venereal diseases, and dermatology.

## LOSOPHAN

An effective antimycotic in all parasitic diseases of the skin, and a mild stimulant and powerful anti-pruritic in the chronic dermatoses.

## TRIONAL

A hypnotic, neurotic and sedative, prompt, safe and serviceable, free from after-effects, and especially suitable for prolonged administration.

## SULFONAL-BAYER

A reliable, safe and active hypnotic and nerve sedative, inducing prolonged, physiological sleep, free from narcosis and disagreeable sequelæ.

*Full Descriptive Pamphlets on application*

**Schieffelin & Co. New York**
*Sole Agents*

**The Treatment of Influenza or La Grippe.**

It is quite refreshing these days to read of a clearly defined treatment for the grip. But in an article in the *Lancet-Clinic*, December 28th, 1895, Dr. James Hervey Bell, 251 East 32d Street, New York City, says he is convinced that too much medication is both unnecessary and injurious. He has few remedies; prescribes them with confidence; and "trusts the rest to nature."

When called to a case of influenza, the patient is usually seen when the fever is present, as the chill, which occasionally ushers in the disease, has generally passed away. Dr. Bell says he then orders that the bowels be opened freely by some saline draught, as hunyadi water or effervescing citrate of magnesia.

For the high fever, severe headache, pain, and general soreness, the following is ordered:

℞ Antikamnia Tablets (5 gr. each), No. xxx.
Sig. One tablet every two hours.

If the pain is extremely severe, the dose is doubled until relief is obtained. Often this single dose of ten grains of antikamnia is followed with almost complete relief from the suffering. Antikamnia is preferred to the hypodermic use of morphia because it leaves no bad after-effects; and also because it has such marked power to control pain and reduce fever. The author says that unless the attack is a very severe one, the above treatment is sufficient.

After the fever has subsided, the pain, muscular soreness and nervousness generally continue for some time. To relieve these and to meet the indication for a tonic, the following is prescribed:

℞ Antikamnia & Quinine Tablets, No. xxx.
Sig. One tablet three times a day.

This tablet contains two and one-half grains of each of the drugs, and answers every purpose until health is restored.

Occasionally the muscular soreness is the most prominent symptom. In such cases the following combination is preferred to antikamnia alone:

℞ Antikamnia & Salol Tablets, No. xxx.
Sig. One tablet every two hours.

This tablet contains two and one-half grains of each drug.

Then again it occurs that the most prominent symptom is an irritative cough. A useful prescription for this is one-fourth of a grain sulphate codeine and four and three-fourths grains antikamnia. Thus:

℞ Antikamnia & Codeine Tablets, No. xxx.
Sig. One tablet every four hours.

Dr. Bell also says that in antikamnia alone we have a remedy sufficient for the treatment of nearly every case, but occasionally one of its combinations meets special conditions. He always instructs patients to crush tablets before taking.


Thousands of Physicians
are now using

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Steam Sterilizers

at Hospitals and in their offices, for Sterilizing Instruments, Dressings etc., and recommending the Family Sizes to their patients for Sterilizing or Pasteurizing milk.

We make Sterilizers for every purpose, and have circulars giving complete information. Address,

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ARTIFICIAL LIMBS. Established 1857.

BEST LEG WITH WOOD OR RUBBER FOOT, AND WOOD OR ADJUSTABLE LEATHER SOCKET $50 TO $70

Arms with Ball and Socket Wrist Joints.

These limbs have been endorsed by such men as Prof. Esmarch; Valentine Mott, M. D.; Willard Parker, M. D.; Gordon Buck, M. D.; and scores of other eminent members of the profession.

We make one-fourth of all Limbs Supplied the U. S. Government for Pensioners.

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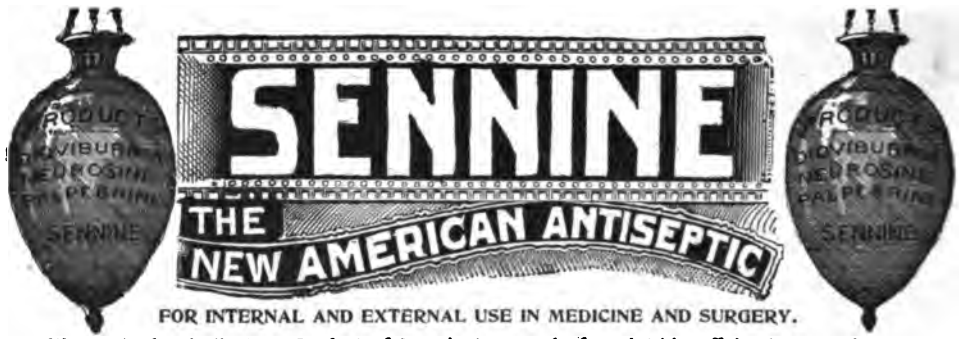


FOR INTERNAL AND EXTERNAL USE IN MEDICINE AND SURGERY.

**Composition.**—A chemically Pure Product of Boracic Acid and Phenol.

**Physical Properties.**—A very fine white Powder, Odorless, slightly Astringent, of Sweetish Taste.

**Medical Properties.**—Antiseptic, Antizimotic, Bactericide, Deodorant, Disinfectant.

**Comparatively Inexpensive.**—Five parts **Sennine** dissolved in one hundred parts of water (two drachms make four pints) is sufficiently strong for an antiseptic wash.

**Free from Toxic and Irritating Effects.**—A substitute for Carbolic Acid, Bichloride of Mercury, Iodoform, etc.

Put up in two-ounce tin boxes with inner perforated cover for convenience of applying. Price, **$1.00.** Samples and literature mailed **Free** to physicians on application, or the 2 oz. Box postpaid on receipt of **$1.00.**

# DIOVIBURNIA

## Uterine Tonic, Antispasmodic, and Anodyne.

A reliable and trustworthy remedy for the relief of Dysmenorrhœa, Amenorrhœa, Menorrhagia, Leucorrhœa, Subinvolution, Threatened Abortion, Vomiting in Pregnancy, and Chlorosis; directing its action to the entire uterine system as a general tonic and antispasmodic.

**Formula.**—Every ounce contains ¼ drachm each of the fluid extracts: Viburnum Prunifolium, Viburnum Opulus, Dioscorea Villosa, Aletris Farinosa, Helonias Diocia, Mitchella Repens, Caulophyllum Thalictroides, Scutellara Lateriflora.

**Dose.**—For adults, a dessertspoonful to a tablespoonful three times a day, after meals. In urgent cases, where there is much pain, dose may be given every hour or two, **always in hot water.**

### TESTIMONIALS.

L. Ch. Boisliniere, M. D., Prof. of Obstetrics, St. Louis Medical College.

St. Louis, June 18, 1888.

I have given DIOVIBURNIA a fair trial, and found it useful as a uterine tonic and antispasmodic, relieving the pains of dysmenorrhœa, and regulating the uterine functions. I feel authorized to give this recommendation of DIOVIBURNIA, as it is neither a patented nor a secret medicine. L. Ch. BOISLINIERE, M. D.

From John B. Johnson, Professor of the Principles and Practice of Medicine, St. Louis Medical College.

St. Louis, June 20, 1888.

I cheerfully give my testimony to the virtues of a combination of vegetable remedies, prepared by a well-known and able pharmacist of this city, and known as DIOVIBURNIA, the component parts of which are all well known to all physicians, and therefore have no relation to quack remedies. I have employed this medicine in cases of dysmenorrhœa, suppression of the catamenia, and in excessive leucorrhœa, and have been much pleased with its use. I do not think its claims (as set forth in the circular accompanying it) to be at all excessive. I recommend its trial, believing it will give satisfaction. Respectfully,

JOHN B. JOHNSON.

H. Tuholske, M. D., Professor Clinical Surgery and Surgical Pathology, Missouri Medical College, also Post-Graduate School of St. Louis.

St. Louis, June 23, 1888.

I have used DIOVIBURNIA quite a number of times—sufficiently frequently to satisfy myself on its merits. It is of unquestionable benefit in painful dysmenorrhœa. It possesses antispasmodic properties which seem especially to be exerted on the uterus. DR. H. TUHOLSKE.

# NEUROSINE

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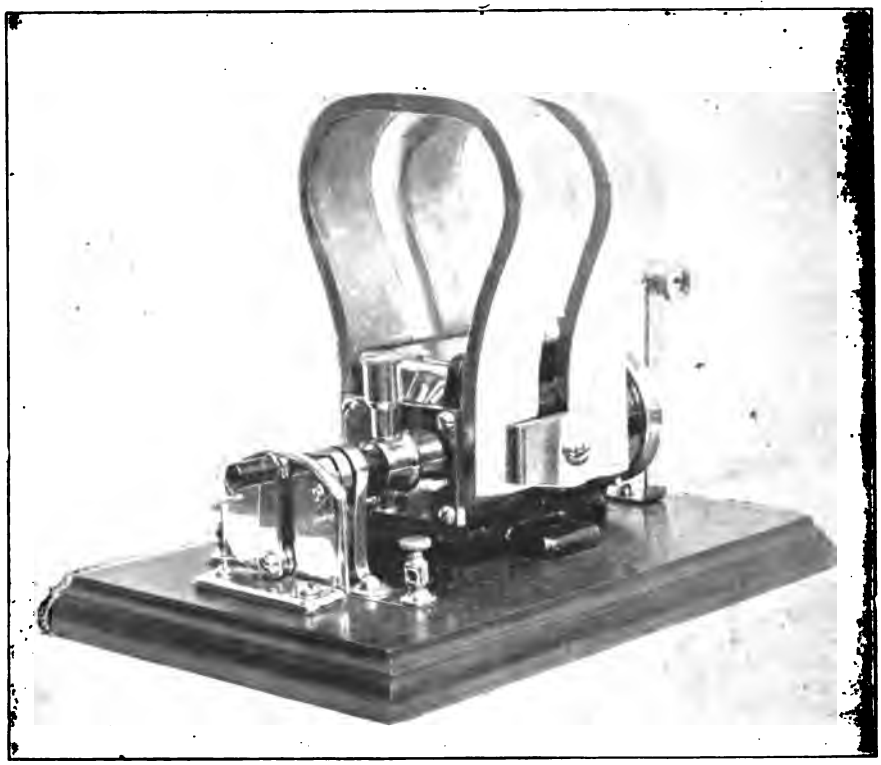

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Bulletin of the Sanitarium Hospital and Laboratory of Hygiene.
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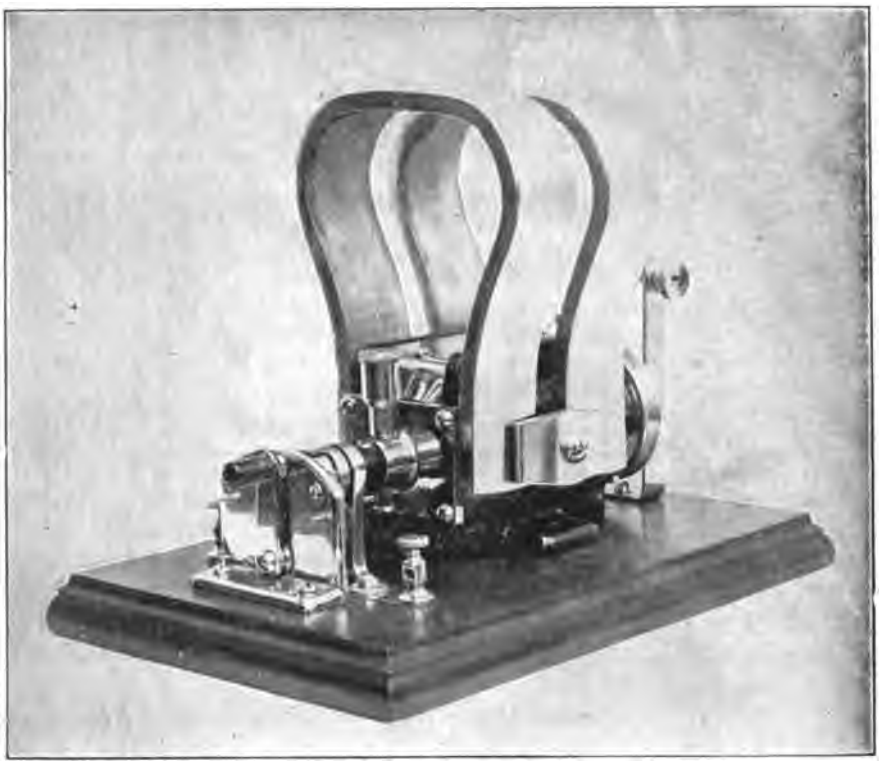

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| 10 Mail Ex. | 4 L'v'd Ex. | 6 Ad. Ex. | 42 Mixd Tr'n. | 2 Pt. H Pass | | 11 Mail Ex. | 1 Day Ex. | 3 Ar'd L'v'd | 23 B. C. Pass. | 5 P'tn Ex. |
| a m | p m | p m | | | | p m | p m | p m | | a m |
| 9.00 | 3.10 | 8.15 | a m | ..... | ..D.Chicago A.. | 5.45 | 1.50 | 9.10 | ..... | 7.40 |
| 11.25 | 5.05 | 10.30 | 6.00 | ..... | ..Valparaiso.. | 5.05 | 11.35 | 7.10 | ..... | 5.45 |
| p m | | | | | | | | | | |
| 1.05 | 6.30 | 12.00 | 10.05 | ..... | ..South Bend.. | 3.10 | 10.15 | 5.44 | ..... | 4.10 |
| 1 46 | 7.12 | 1 .45 | 12.40 | ..... | ..Cassopolis .. | 2.15 | 9.40 | 5.13 | ..... | 3.25 |
| 2.33 | ..... | †1.33 | 3.42 | ..... | ..Schoolcraft.. | 1.20 | ..... | ..... | ..... | ..... |
| 2.44 | 7.55 | 1.48 | 4.00 | a m | ..Vicksburg.. | 1.10 | 8.52 | ..... | p m | 2.37 |
| 3.30 | 8.35 | 2.40 | 6.20 | 7.01 | ..Battle Creek.. | 12.15 | 8.15 | 3.55 | 9.35 | 1.55 |
| 4.33 | 9.26 | 3.25 | ..... | 7.47 | ....Charlotte.. | 11.14 | 7.23 | 3.07 | 8 40 | 12.53 |
| 5.11 | 9.55 | 4.00 | ..... | 8.20 | ..Lansing.. | 10.40 | 6.53 | 2.40 | 8.00 | 12.20 |
| 6.30 | 10.45 | 5.03 | ..... | 9.30 | ..Durand.. | 9.35 | 6.05 | 1.55 | 6.50 | 11.28 |
| 7.30 | 11.17 | 5.40 | ..... | 10.05 | ..Flint.. | 8.55 | 5.35 | 1.28 | 5 47 | 10.55 |
| 8.15 | 11.50 | 6.15 | ..... | 10.43 | ..Lapeer.. | 7.49 | 5 02 | 1.00 | 5 10 | 10.01 |
| 8.42 | a m | 6.35 | ..... | 11.06 | ..Imlay City.. | 7.29 | ..... | ..... | 4 48 | ..... |
| 9.50 | 1.00 | 7.30 | ..... | 12.05 | ....Pt. H'n Tunnel.. | 6.50 | 3.54 | 11.55 | 3 50 | 8.45 |
| | p m | | | | | a m | a m | a m | p m | p m |
| 9.23 | ..... | ..... | ..... | ..... | ..Detroit.. | ..... | ..... | 10.40 | 4.05 | 8.45 |
| ..... | a m 8.15 | p m 5.25 | ..... | ..... | ..Toronto.. | ..... | p m 9.20 | ..... | ..... | p m 1.00 |
| ..... | p m 8.15 | a m 7.25 | ..... | ..... | ..Montreal .. | ..... | a m 9.15 | ..... | ..... | ..... |
| ..... | a m *8.12 | p m 7.15 | ..... | ..... | ..Boston.. | ..... | a m 8.30 | ..... | ..... | ..... |
| ..... | a m 7.50 | p m 4.25 | ..... | ..... | ....Susp'n Bridge.. | ..... | p m 10.15 | a m 7.05 | ..... | p m 2.35 |
| ..... | a m 7.00 | p m 5.40 | ..... | ..... | ..Buffalo.. | ..... | ..... | ..... | ..... | p m 1.00 |
| ..... | p m 8.53 | a m 8.08 | ..... | ..... | ..New York.. | ..... | a m 8.15 | p m 6.10 | ..... | p m 8.00 |
| ..... | ..... | a m 10.20 | ..... | ..... | ..Boston.. | ..... | ..... | ..... | ..... | p m 7.00 |

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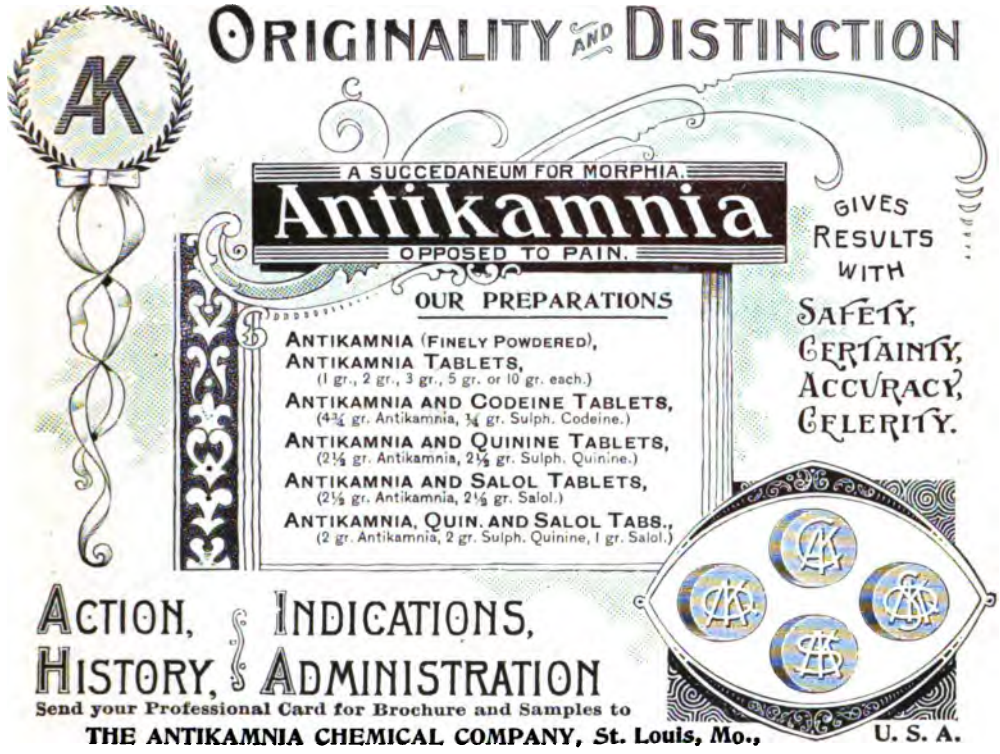
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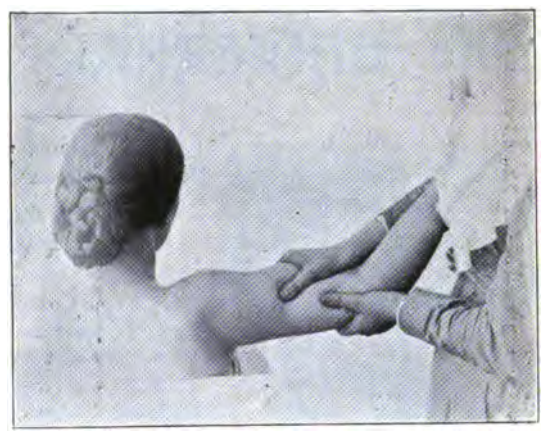

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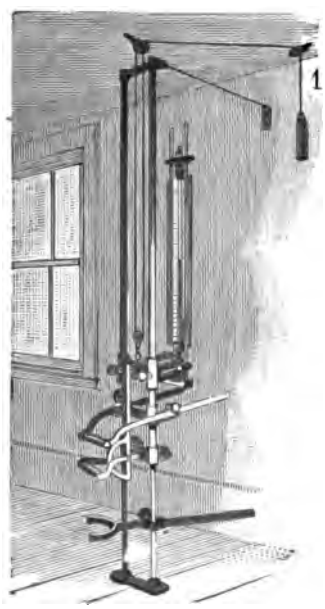

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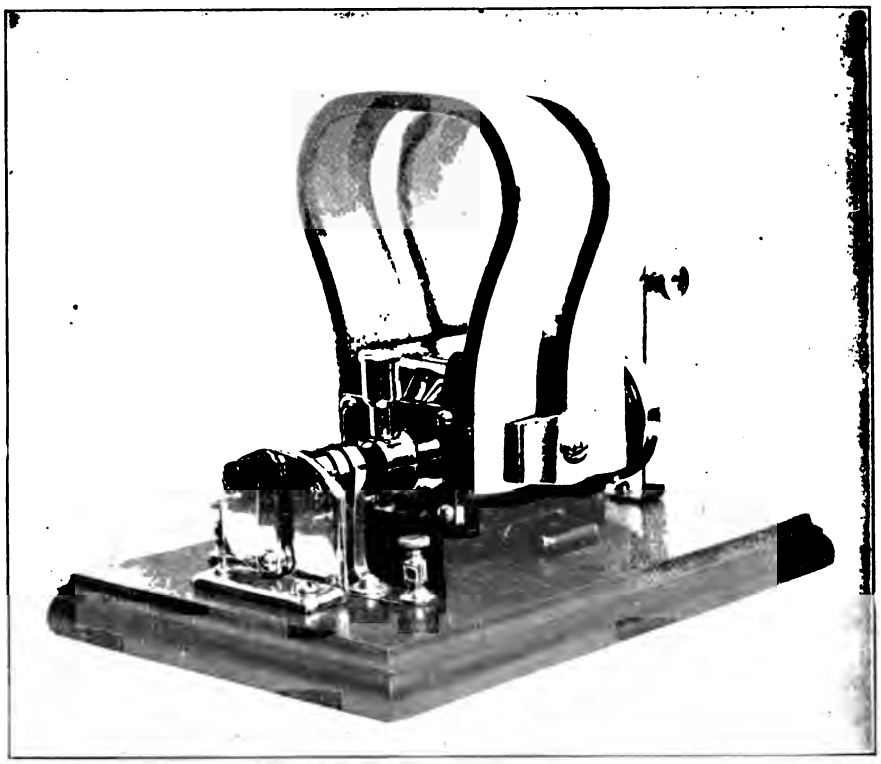

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| a m | p m | p m | | | | p m | p m | p m | | a m |
| 9.00 | 3.10 | 8.15 | a m | | D. Chicago A. | 6.45 | 1.50 | 9.10 | | 7.50 |
| 11.25 | 5.05 | 10.30 | 6.00 | | Valparaiso | 5.05 | 11.35 | 7.10 | | 5.45 |
| p m | | | | | | | | | | |
| 1.05 | 6.30 | 12.40 | 10.05 | | South Bend | 3.10 | 10.15 | 5.44 | | 4.10 |
| 1.46 | 7.12 | 1.45 | 12.40 | | Cassopolis | 2.15 | 9.40 | 5.13 | | 3.28 |
| 2.33 | | †1.33 | 3.42 | | Schoolcraft | 1.20 | | | | |
| 2.44 | 7.55 | 1.48 | 4.00 | a m | Vicksburg | 1.10 | 8.52 | | p m | 2.37 |
| 3.30 | 8.36 | 2.40 | 6.20 | 7.00 | Battle Creek | 12.15 | 8.15 | 3.55 | 9.35 | 1.50 |
| 4.33 | 9.26 | 3.25 | | 7.47 | Charlotte | 11.14 | 7.23 | 3.07 | 8.40 | 12.53 |
| 5.10 | 9.55 | 4.00 | | 8.20 | Lansing | 10.40 | 6.55 | 2.40 | 8.00 | 12.20 |
| 6.30 | 10.45 | 5.03 | | 9.30 | Durand | 9.35 | 6.05 | 1.55 | 6.50 | 11.28 |
| 7.30 | 11.17 | 5.40 | | 10.05 | Flint | 8.35 | 5.35 | 1.28 | 5.47 | 10.55 |
| 8.15 | 11.50 | 6.15 | | 10.43 | Lapeer | 7.49 | 5 02 | 1.00 | 5.10 | 10.01 |
| 8.42 | a m | 6.35 | | 11.06 | Imlay City | 7.28 | | | 4.48 | |
| 9.50 | 1.00 | 7.30 | | 12.05 | Pt. H'n Tunnel | 6.50 | 3.5 | 11.55 | 3.50 | 8.46 |
| | p m | | | | | a m | a m | a m | p m | p m |
| 9.25 | | | | | Detroit | | | 10.40 | 4.05 | 8.45 |
| | a m | p m | | | | | p m | | | p m |
| | 8.15 | 5.25 | | | Toronto | | 9.20 | | | 1.00 |
| | p m | a m | | | | | a m | | | |
| | 8.15 | 7.25 | | | Montreal | | 9.15 | | | |
| | a m | p m | | | | | a m | | | |
| | 7.12 | 7.15 | | | Boston | | 8.30 | | | |
| | a m | p m | | | | | p m | a m | | p m |
| | 7.50 | 4.25 | | | Susp'n Bridge | | 10.15 | 7.05 | | 2.25 |
| | a m | p m | | | | | | | | p m |
| | 7.00 | 5.40 | | | Buffalo | | | | | 1.00 |
| | p m | a m | | | | | a m | p m | | p m |
| | 8.52 | 8.03 | | | New York | | 8.15 | 5.10 | | 8.00 |
| | | a m | | | | | | | | p m |
| | | 1.20 | | | Boston | | | | | 7.00 |

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# The Stomach: Its Disorders and How to Cure Them.


By J. H. KELLOGG, M. D.,

Superintendent of the Battle Creek (Mich.) Sanitarium, Member of the British and American Associations for the Advancement of Science, the American Microscopical Society, the Society of Hygiene of France, Author of the Home Hand-Book of Domestic Hygiene and Rational Medicine, Etc.


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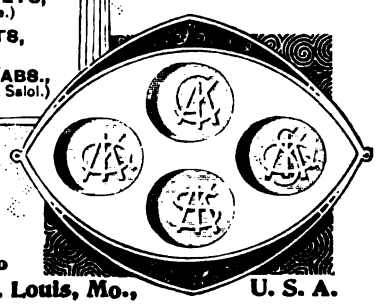

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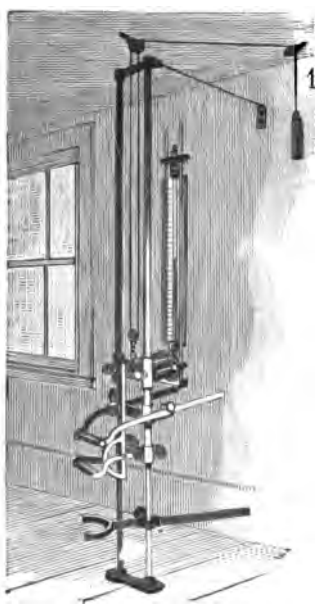

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(See page 79.)

# MODERN MEDICINE

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# BACTERIOLOGICAL REVIEW.

VOL. V. BATTLE CREEK, MICH., U. S. A, APRIL, 1896. NO. 4.


## ORIGINAL ARTICLES.

### WHAT IS THE MATTER WITH THE AMERICAN STOMACH?[1]

NEW AND EXACT METHODS OF FINDING OUT.


BY J. H. KELLOGG, M. D.,
Battle Creek, Mich.


(Concluded.)

STUDY OF THE GERMS OF THE STOMACH.

STILL another question of interest which I have made the subject of experimentation is the relation of food to fermentation. My experiments in this line are yet (December, 1895) incomplete, but one or two facts of interest may be noted. The relation of a coated tongue to indigestion, especially that form frequently termed "biliousness," is universally recognized. It is equally well known that the appearance of the tongue when coated is due to a growth of micro-organisms. The tongue is coated, not out of sympathy with the stomach, as was formerly supposed, but in consequence of the development upon it to an abnormal extent of micro-organisms in connection with a similar abnormal development of micro-organisms in the stomach. A bad taste in the mouth is due to the development of ptomains which are not only disagreeable in flavor, but toxic in character. The absorption of these ptomains from the stomach gives rise to headache, vertigo, mental confusion, and the great variety of other symptoms of which bilious persons complain.

Studies which I have made with reference to the relation of conditions of the stomach to urinary toxicity, lead me to believe that many symptoms which are attributed to morbid states of the nervous system, are really due to autointoxication growing out of morbid conditions in the stomach, which are, to some degree, at least, indicated by a low coefficient of albumin digestion. A low coefficient indicates not only imperfect digestion of albumin, but the production of a proportionately large quantity of vitiated albuminoid substances which are worthless for nutrition, and which appear to possess toxic properties, giving rise to languor, drowsiness, headache, nervousness, and possibly also to neuralgia, rheumatic pains, and other symptoms commonly recognized as belonging to the arthritic diatheses.

Within the last few months we have undertaken in the Laboratory of Hygiene connected with the Battle Creek Sanitarium, under the supervision of Professor Novy, of the University of Michigan, an extensive investigation of the microbic life of the stomach, for the purpose of determining, if possible, what relation there may be between microbes in general or any specific microbe or group of microbes and the various pathological conditions of the stomach, particularly in such functional disorders as biliousness, migraine, catarrh of the stomach, etc. Dr. Turck, of Chicago, has been for some years engaged in this line of investigation, and has developed some most interesting and important results. I am giving particular attention to the study of the subject in connection with the peculiar idiosyncrasies which patients frequently present in reference to such articles of food as milk, fats, meat, starch, etc.

An interesting fact was developed at the beginning of this investigation which I wish especially to mention, as it emphasizes most decidedly one point relating to the hygiene of digestion and the therapeutics of indigestion. The first step in the investigation was to become familiar

[1] Presented at the Annual Meeting of the Mississippi Valley Medical Association, held at Detroit, Mich., Sept. 4-6, 1895.

with the microbes which are normally found present in the stomach. Several healthy young men were accordingly selected, and test breakfasts, each consisting of one and one-half ounces of granose, a thoroughly sterilized preparation made from entire wheat, mixed with eight ounces of water, were administered. From nine stomach fluids obtained after this meal, only two cultures were obtained, seven of the stomach fluids having been found perfectly sterile. In the two instances in which microbes were found, they were very few in number. The test meal was then changed, and water biscuit, consisting of flour and water baked in small cakes, were substituted for granose. Germs in great abundance, with yeast germs of various sorts, at once appeared. Ordinary fermented bread and similar foods likewise gave abundance of microbes in nearly every case.

Since the above observation was made, careful bacteriological examination has revealed the total absence of germs in more than fifty additional cases. In fact, it may be said to be demonstrated that with sterilized food, no germs are to be found in the stomach at the end of an hour after eating.

This experiment shows very clearly, not only that the stomach is capable of destroying the microbes which are incidentally introduced along with the meal, provided the food is thoroughly sterilized (at least in the case of a cereal food), but that the stomach does ordinarily do this, and hence that the action of microbes in the stomach is not essential to the normal processes of digestion.

The chemical investigations made after the test meal are likewise in accordance with these results. In a case in which the coefficient of fermentation was found to be three, after a meal consisting of granose and water, the coefficient was found to be ten after a test meal of baker's bread and water.

The reason for these results was evidently due to the presence of yeast germs in the bread, as the material was the same,—wheat in each case. Granose consists of very thin flakes which have been very thoroughly cooked by both moist and dry heat; water biscuit consist of ordinary flour baked in cakes half an inch thick, so that the interior of the cake is not exposed to a sufficiently high degree of heat to thoroughly sterilize it. The center of a loaf of ordinary baker's bread likewise does not reach a sufficiently high temperature during baking to destroy the microbes which are always present, being contributed by the yeast and flour, as well as by the water used in making the bread.

Recent studies which I have undertaken for the purpose of determining the relation of such germ-infected foods as cheese, meat, unwashed fruit, etc., have given some very interesting results. For example, in the case of cheese, with which five experiments were made, the stomach fluid, though practically sterile, gave rise to more than 17,000,000 colonies for one ounce of stomach fluid. Scraped beefsteak, in the condition usually furnished for table use, gave 788,580 colonies. Unwashed fruit (grapes) gave 535,240 colonies. Fermented yeast bread gave rise to 45,300 colonies.

In a future paper I hope to be able to present many interesting facts upon this branch of the subject.

The technical portion of the bacteriological work done in connection with these studies has been done by Dr. Geo. W. Burleigh, bacteriologist of the Battle Creek (Mich.) Sanitarium, with the collaboration and assistance of Prof. F. G. Novy, M. D., professor of bacteriology in the University of Michigan, and a bacteriologist of large experience.

Out of many hundreds of experiments which have been carried out under my supervision in our laboratory, I have given only a few as illustrative of facts which may be gathered by this mode of study. The conclusions to which I have arrived as the result of their investigations thus far, may be briefly summarized as follows: —

1. The stomach digestion of starch is an important digestive function, and one which requires consideration in the treatment of dyspepsia.

2. The best means of promoting salivary digestion is the use of dry food and its thorough mastication.

3. The use of strong acids, even vegetable acids, is prejudicial to the digestion of starch in the stomach.

4. Thorough sterilization of food is important as a means of aiding the stomach in ridding itself of microbes.

5. The use of vinegar, condiments, tea, coffee, and alcohol is prejudicial to both salivary and gastric digestion.

6. Pepsin and other digestive agents, with the possible exception of the diastase of malt, are practically valueless as aids to digestion.

INFLUENCE OF MALT UPON STOMACH DIGESTION.

I have made a possible exception of malt in my statement respecting digestive ferments, for the reason that we find rare cases in which the saliva is so deficient in quality, even though abundant in quantity, that its digestive work must be very imperfectly performed. In such cases the use of malt in liberal quantities might prove beneficial. However, by comparison of the digestive activity of malt with that of saliva, by Roberts's method of diastasimetry, I have found that two parts of average saliva are equal in digestive vigor to one part of malt; hence all the good effects which may be obtained from malt, so far as its digestive qualities are concerned, may be obtained by a little extra mastication of food, thus securing a more liberal admixture of saliva.

I do not wish to be understood, however, as indicating that malt may not be otherwise beneficial. It is unquestionably an excellent food, and doubtless aids in some way in promoting the digestive process, either as a peptogen or as a regulator of the process of absorption.

A young man whose stomach fluid, after a meal consisting of one ounce of gluten mixed with eight ounces of water and swallowed, gave the following figures: Total acidity, .248; free HCl, .076; combined chlorin, .184, furnished after a meal consisting of one ounce of liquid malt mixed with one ounce of gluten and the usual quantity of water, a stomach fluid giving the following figures: Total acidity, .340; free HCl, .132; combined chlorin, .190, an increase of free HCl in this case of nearly eighty per cent., and also an increase of combined chlorin, which could be attributed to nothing except the malt, thus demonstrating very clearly the peptogenic property of malt.

In another paper now in preparation, of which this is a brief abstract, prepared for this occasion, I hope to present, by means of a detailed report of a large number of experiments, the views which are scarcely more than hinted at in this paper, in a clearer light, and, if possible, with still more conclusive facts.

The interesting researches relating to the chemistry of digestion which have been conducted in Germany within the last few years, by Boas, Ewald, Leube, and others, and the considerable degree of success which has attended the application of these results to therapeutics, has recently created an unprecedented interest in a class of disorders which, although exceedingly common, and perhaps invested with greater intrinsic importance than any other class of ailments, has heretofore been very greatly neglected. For some time the methods formulated by German investigators, particularly the colorimetric methods of Ewald and Boas, were accepted without question as a satisfactory means of precise diagnosis, in consequence of the evident advantages which they presented over methods in former use. Investigators in other countries, particularly in France and England, however, as well as practical clinicians in the leading medical centers of Germany, soon began to discover serious defects in the practical application of these new methods of examining stomach fluids. This skepticism has led to important experimental inquiries for the purpose of determining more accurate means of diagnosis.

My own interest in this subject has been stimulated by a desire to meet to the fullest degree possible, the therapeutic demands of the patrons of an institution which receives annually several thousand persons suffering from chronic ailments of various sorts, a large proportion of whom present some form of digestive disturbance. Some twenty years' experience in the treatment of chronic invalids in this establishment has thoroughly convinced me of the paramount importance of precision in diagnosis in relation to digestive disorders, not only in the treatment of maladies generally recognized as having their seat in the stomach, but in various dyscrasies and chronic maladies which, until very recently, at least, have not been recognized as having any very direct relation to digestive derangements.

My purpose in this paper has been to call attention to the accurate methods which are now available in the study of the functional disorders of digestion through the exact chemical examination of the stomach fluid obtained after a test meal, and to the interesting experimental inquiries which these methods enable us

to undertake, whereby it is possible to ascertain exact facts of great importance in relation to the hygiene and therapeutics of this very large class of ailments.

In the great majority of cases,—and usually those in which the greatest and most rapid improvement has taken place,—I am not able to show the results by comparison of the analyses of stomach fluids, for the reason that only one examination was found necessary, and the patients, being satisfied with their improvement, did not care to submit to a second examination merely for scientific purposes. A second examination has been made, however, in 516 cases, and in 127 cases, more than two examinations have been made, so that I have had abundant opportunity not only to test the accuracy of the method, but to demonstrate its value as a guide in the application of therapeutic measures. However, I might append many scores of cases as illustrative of the excellent therapeutic results obtainable by the employment of this exact method of directing therapeutic effort. But as this paper is already longer than I desired to make it, I will only add the following briefly stated cases, as illustrative of the practical results obtainable after the failure of other methods:—

### Case I.

The patient, Mr. C——, a professional man, aged forty-two years, had suffered for a number of years from disturbances of digestion, which had finally reduced him almost to a skeleton, and rendered him incapable of pursuing his ordinary professional duties. After consulting numerous specialists, and employing all the means within his reach, he finally came to the Battle Creek Sanitarium. On examination, the patient was found to be suffering from marked dilatation of the stomach, with considerable hyperesthesia of the lumbar ganglia of the sympathetic and the solar plexus; was very anemic, the blood count being 4,880,000; was unable to digest anything. Within a few hours after taking food into the stomach, the patient invariably began to suffer pain in the left temple, which gradually increased until he became nearly beside himself. Relief was obtainable only by evacuation of the stomach. The stomach was unable to tolerate the smallest amount of free fat, and its aversion to starch in any form was almost equal. The results of the examination of the stomach fluid at the beginning of treatment, and again four months later, are shown in the table below. In the first column are given the results of the first examination; in the second column, those obtained in the last examination. A number of examinations were made during the four months the patient remained under treatment, most of which showed progress in the direction of improvement:—

| | Normal quantities. | 1. | 2. |
|---|---|---|---|
| Total acidity..... | (.180–.200 gms.) | .232 | .184 |
| Calculated acidity. | " " | .300 | .182 |
| Total chlorin..... | (.300–.330 " ) | .418 | .366 |
| Free HCl..... | (.025–.050 " ) | .054 | .030 |
| Combined chlorin.. | (.155–.180 " ) | .246 | .152 |
| Fixed chlorids..... | (.100–.110 " ) | .114 | .184 |
| Coefficient of albumin digestion ... | (1.00) | .70 | 1.00 |
| Coefficient of starch | (1.00) | .67 | .46 |
| " " salivary activity .... | (1.00) | 2.00 | .50 |
| Fermentation .... | (0.00) | 6. | 3. |
| Chlorin liberation.. | | 1.10 | .75 |

By a comparison of the figures given in columns 1 and 2, it will be noted, first, that the patient was suffering at the beginning of treatment with extreme hyperpepsia, the calculated acidity being 50 per cent. higher than normal. It will also be noted that the coefficient for the digestion of albumin was 30 per cent. below normal, indicating the development of a large amount of toxic albuminoid substances in the stomach from the imperfect digestion of proteids, a fact which could be ascertained in no other way than by this method of investigation.

The figures given in column 2 indicate a return to the normal standard in the most important particulars. Both the total acidity and the calculated acidity are normal. The amount of free HCl, which in the first examination was nearly forty per cent. above normal, was practically normal. The coefficient of albumin digestion was normal, and the coefficient of chlorin liberation, which was 10 per cent. too high in the first examination, was even a little below normal, it being even lower than at the first examination. This was evidently due to a temporary change in the efficiency of the saliva, which happened to be at this time 50 per cent., or one fourth that found in the first examination. I know of no reason for this change, but have frequently noted a fluctuation of this kind in the digestive power of the saliva. I find that the saliva, like

the gastric juice, is variable in quality, in some cases presenting a degree of efficiency ten or twelve times the normal, while in other cases it is much below the normal standard. So great a variation as this, however, is not observed in individual cases, although cases are not infrequently encountered in which the saliva shows at times double or even more than double the efficiency which it does at other times.

Improvement in the patient's general symptoms was as great as that indicated by the examination of the stomach fluid. He gained nearly twenty pounds in flesh, was relieved of the headache, no longer required the use of the stomach-tube, and was wonderfully improved in general vigor. He still, however, found it necessary to exercise great care in diet, on account of the permanent disability resulting from the extreme dilatation of the stomach. The important things to be gained in a case of this kind are the correction of morbid processes in the stomach, improvement, so far as possible, in the muscular tone of the organ, and the establishment of a dietary adapted to the patient's condition.

### Case II.

Miss C ——, aged thirty; received into the institution Aug. 20, 1895. The leading symptoms presented were distention after eating, accompanied by nervousness, depression, headache, giddiness, palpitation of the heart, disturbing dreams, thickly coated tongue, sour and offensive breath. The patient was thin in flesh, weak, and unable to continue the duties of her profession. Examination of the blood showed the hemoglobin to be 79 per cent. of what it should be, and the blood count 4,400,000.

The results of the examination of the stomach fluid at the beginning of treatment, and again after a few weeks' treatment, are shown in the following table: —

| | Normal quantities. | 1. | 2. |
|---|---|---|---|
| Total acidity..... | (.180–.200 gms.) | .100 | .174 |
| Calculated acidity.. | " " | .100 | .270 |
| Combined chlorin... | (.155–.180 " ) | .170 | .270 |
| Coefficient of albumin digestion .... | (1.00) | .55 | .67 |
| Coefficient of starch. | (1.00) | .55 | .71 |
| Fermentation..... | (0.00) | 5. | 0. |

The physical condition of the patient had improved correspondingly in every respect. The stomach, which was at first prolapsed two inches below the umbilicus, was restored to normal position. The improvement in the blood was shown by an increase of hemoglobin to 93 per cent. The fermentation had disappeared, and the amount of work done by the stomach in the digestion of albumin had nearly doubled, while the starch digestion had improved nearly 30 per cent. The patient was discharged practically well, with the understanding that she would continue to exercise care in regard to diet, and should for some time longer employ such exercises and simple measures of treatment as had been found advantageous.

### Case III.

Mrs. H ——, aged fifty-one years. The patient was much emaciated, having been a chronic invalid for many years, suffering from eructations of gas, regurgitation of food, nausea, daily pain, burning, faintness, heaviness at the stomach, aortic palpitation, gaseous distention of the bowels, constipation, drowsiness after meals, morbid taste, dryness of the throat, accompanied by great thirst. On examination of the stomach, it was found to be prolapsed three inches below the umbilicus, the patient having an inguinal hernia on her left side. The right kidney was prolapsed. The patient had suffered from most of the symptoms present for fourteen years. The liver was prolapsed to the umbilicus, and had been mistaken for an ovarian tumor. The patient suffered frequent attacks of jaundice, accompanied by intense itching of the skin; had been steadily losing flesh for a long time. The hemoglobin was found to be 70 per cent. of the normal. The results of the first examination of the stomach fluid in this case are shown in column 1 of the following table; the results of the second examination, made a few months later, are shown in column 2: —

| | Normal quantities. | 1. | 2. |
|---|---|---|---|
| Total acidity..... | (.180–.200 gms.) | .020 | .080 |
| Calculated acidity.. | " " | .086 | .112 |
| Total chlorin..... | (.300–.330 " ) | .238 | .128 |
| Coefficient of albumin digestion.... | (1.00) | .23 | .71 |

This patient's case required not only long and faithful treatment, but also an operation for the cure of the inguinal hernia, and for the restoration of the kidney to normal position by nephrorrhaphy. While operating upon the hernia, the opportunity was improved to replace the stomach, suturing it in such a position as to support the liver also. The stomach

was held in position by buried silkworm-gut sutures, carefully sterilized, and did not give any apparent inconvenience.

As will be noted by a comparison of the figures given, the coefficient of albumin digestion improved more than 300 per cent. The total amount of normal work done by the stomach was proportionately increased. The patient accordingly made a very appreciable gain in strength, flesh, and blood. On leaving the institution, examination of the blood showed hemoglobin ninety-three per cent., blood count 4,150,000.

### Case IV.

Mrs. I——, aged twenty-five, a recent patient, had suffered for six years from indigestion, with constant pain in the stomach, and occasionally severe chronic pains and fainting, which were relieved only by an emetic. During the first year of her invalidism she was troubled only during the summer, but for the last year the stomach disorder had been constant. The patient complained of a bitter taste in the mouth, heaviness after meals, flatulence, severe constipation, requiring the daily use of the enema, giddiness, swelling of the hands and feet, pain in the region of the heart followed by fainting, extreme nervousness, insomnia, attacks of vomiting, and frequent loss of consciousness (nervous apoplexy). Pepsin, purgatives, tonics of all sorts, dieting, etc., had been employed, but without benefit. The patient was steadily getting worse, and at the time she arrived she could scarcely rise from her chair without assistance. The tongue was exceedingly foul. Examination of the blood showed marked anemia, the hemoglobin being seventy-five per cent. of the normal, and the blood count 3,700,000, or eighty-two per cent. of the normal number. The white corpuscles were reduced to a greater extent than the red, there being only sixty-one per cent. of the normal. Physical examination of the stomach showed its lower border to be three inches below the normal position. There was extreme hyperesthesia of all the lumbar ganglia of the sympathetic. The patient had also some pelvic pain, probably due to a diseased condition of the left ovary, which was prolapsed and very sensitive; but this evidently had very little to do with the patient's general suffering.

Examination of the stomach fluid showed very marked hyperpepsia, the following figures being obtained:—

| | |
|---|---|
| Total acidity (A) | .276 gms. |
| Calculated acidity (A') | .288 " |
| Total chlorin (T) | .366 " |
| Free HCl (H) | .058 " |
| Combined chlorin (C) | .230 " |
| Fixed chlorids (F) | .078 " |
| Maltose (M) | 1.440 " |
| Dextrin and soluble starch | .980 " |
| Fatty acids (from fermentation) (L) | .005 " |

The following figures were obtained for the coefficients:—

| | |
|---|---|
| a, digestion of proteids | .92 |
| b, starch digestion | .74 |
| c, salivary activity | .30 |
| Fermentation | 5. |
| Solution | .96 |
| Absorption | .15 |

The patient was placed at once upon a dietary consisting of granose, a perfectly dry preparation of wheat, in thin, thoroughly cooked, well-baked flakes, and bromose, a preparation of malted nuts in which the starch is digested and the fat emulsified. Lavage was ordered at the outset, and at its first application there was brought from the stomach an astonishing amount of undigested food, the result of the slow absorption. Before coming to the Sanitarium, the patient had been living upon malted milk and cream, the worst possible food for a person in her condition, a dry diet being indicated. A change of diet and the application of Swedish movements, stomach massage, fomentations, electricity, tonic baths, and other measures, secured immediate relief from suffering, and by the beginning of the second week the patient showed a gain in flesh. At the end of three weeks she was walking several miles daily. She had gained in fourteen days exactly fourteen pounds of flesh. The dynamometer showed a total increase of strength amounting to 825 pounds. The patient's cheeks were rosy, her lips red, eyes sparkling, and tongue clean. The old symptoms had disappeared, and she declared that she was well enough, and insisted on going home against protest, as a sufficient time had not yet elapsed to insure permanency in the improvement, except under the specially favorable conditions of a rigid regimen and carefully adjusted treatment.

This case is introduced as an indication of what can be done for the relief of stomach disorders by the exact adapta-

tion of diet, regimen, and treatment to a patient's condition.

Many similar cases might be cited. One lady, for example, gained twelve pounds of solid flesh in one week. It is more common, however, for patients to gain more slowly, but a rate of three or four pounds a week is not uncommon. A gentleman patient reported an increase of forty-six pounds in six weeks. A chronic dyspeptic, who had been confined to bed for several months, and under the so-called Salisbury treatment had made no progress toward recovery, gained a pound a day for four weeks.

These cases might be multiplied at great length. Of between four and five thousand cases which have been treated by the methods outlined in this paper, those have been very rare indeed which have not been greatly and rapidly benefited. Many instances might be recorded in which patients gained from ten to forty pounds of flesh within a few weeks, being meanwhile actively engaged in appropriate gymnastic exercises,— a fact worthy of mention, since flesh and blood obtained in connection with proper muscular work is a much more valuable acquisition than that secured by rest-cure methods alone, in which case the gain often disappears with great rapidity when the patient is placed upon his feet. I do not, however, wish to discount the importance of flesh and blood acquired by means of the rest-cure, as that is an invaluable measure when other means fail; but a gain of flesh under work indicates a change for the better in vital conditions, which gives promise of permanency in the patient's improvement.

Patients improve under exercise not only in flesh but in strength. The total strength, as tested by the dynamometer, has been frequently observed to increase from five hundred to fifteen hundred pounds in a single month. It is not an uncommon thing for patients to more than double their total strength within a few weeks.

This nice adaptation of treatment and diet to the patient's condition is only possible by the aid of an exact diagnosis. The technical details of the method employed I shall undertake to give in another paper. It will also appear as an appendix to a recent work on the stomach by Debove and Rémond, which the writer is now translating from the original French, and which will soon be published by the Modern Medicine Publishing Company.

## THE RÖNTGEN PHOTOGRAPHS.

BY J. H. KELLOGG, M. D.

(See Frontispiece.)

THE announcement of the peculiar characteristics of the Röntgen ray, and the interesting photographs, or shadow-prints, obtainable by its means, showing the form of internal structures, like the bones, and of bullets or other foreign bodies embedded in the flesh, has excited a most profound interest, not only in medical circles, but also among scientific men of all classes, and the public generally.

The photographs obtained by the Röntgen ray are not photographs in the ordinary sense of the word, but are rather shadows. The object under examination is placed between the light and a sensitive plate. The results produced are due to the fact that ordinary tissues and many other bodies are, to a considerable degree, transparent, though less so than air. The bones are much less transparent than the soft tissues, hence they appear in the print as of a darker shade, or opaque. In the frontispiece for this month we show a reproduction of Röntgen photographs of portions of the hand and foot, one of which exhibits very graphically the fact that the great toe has two terminal phalanges instead of one.

Much speculation has been offered respecting the possible advantages of this new ray, and the medical uses to which it may be put. While its utility has probably been overestimated, nevertheless it is entirely possible that it may be of even greater service than has been yet suggested.

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THE Pasteur Institute has recently made a summarized report for the whole nine years since the establishment of the institute. More than fifteen thousand persons have been treated, with a mortality rate of about half of one per cent., certainly a wonderful showing for life-saving through the agency of Pasteur's discovery.

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A FROG hung head downward in a child's mouth till it dies is still used as a remedy for thrush in Shropshire, England. One man boasted that his little son "wore out" four frogs before he himself died of convulsions.— *The Daily Lancet.*

# TRANSLATIONS AND ABSTRACTS

[The articles in this department are prepared expressly for this journal.]

## PRECISION IN HYDROTHERAPY.

DR. SIMON BARUCH, of New York, has for several years been doing good missionary work in rational medicine, in his various papers and addresses relative to scientific hydrotherapy, and especially in a recent paper read before the Philadelphia County Medical Society. We quote the following extract from this paper and the discussion upon it, from the *Medical Record*:—

"In the average medical mind the following objections to hydrotherapy at once arise: (1) The difficulty of applying water systematically and with precision, from lack of facilities and the natural repugnance to water on the part of most persons. (2) The espousal of water as a remedy by empirics and ignorant laymen, who have brought it into disrepute. (3) The utter disregard of exactness of technique.

"The last is probably the chief cause of the indifference of the profession, as failure will surely result from inattention to details. It is a too common error to confound all kinds of cold bathing and sponging with the Brand treatment. It has been definitely ascertained that high temperature is not the chief danger to be feared in an attack of typhoid fever. The object of the Brand bath is the support of the nervous system, with a secondary consideration for the temperature. A longer bath at a higher temperature would also reduce the bodily temperature, but it would be lacking in nervous stimulation. Friction of the body and cold affusion of the head augment the influence of the cold bath, which is appreciable in the improved action of the heart, lungs, and secretory organs. To obtain the ideal result a precise technique must be followed. This consists in beginning the friction baths at 65° F. before the fifth day of the disease, and continuing them without fail every three hours, night and day, when the patient is awake, so long as his temperature reaches 102.5° F. The bathing cannot begin too early, and no harm can result, should the case prove not to be one of typhoid fever.

"The judicious employment of water is also capable of excellent results in the treatment of pulmonary tuberculosis. The object here is the improvement of the nutrition. This is effected by first dilating the superficial cutaneous vessels and thoroughly warming the patient by a dry pack; viz., enveloping him in long-haired blankets, or by a hot-air bath short of inducing perspiration. Then he is subjected to a circular or needle bath of a pressure of twenty-five pounds at a temperature of 95° F., gradually reduced in the course of one minute to 85° F. and followed by a fan douche under a pressure of twenty pounds at a temperature of 90° F., reduced daily one degree. If precision in the technique be not observed, and the patient is exposed to lower temperatures or subjected to higher pressures at the beginning, the results will be serious and discouraging.

"In cases of neurasthenia, of atonic and nervous dyspepsia, and of simple chlorosis, the results obtained with hydrotherapy, applied with judgment and skill, in improving the nutrition and hematosis are striking. A patient with chlorosis may be instructed to stand in a tub containing twelve inches of water at a temperature of 100° F., while an attendant squeezes from a crumpled towel or two bath-gloves upon successive parts water at a temperature of 90° F. or less, according to the reactive capacity of the patient, meanwhile rubbing gently the surface of the body. The patient is then gently dried with a soft linen towel, and subsequently rubbed with a crash towel. The temperature of the bath should be reduced one or two degrees daily until 50° F. is reached; then larger quantities of water should be poured over the body by squeezing a large sponge quickly over different parts. Later, pitcherfuls or basinfuls may be poured over the body with some force.

"In the discussion, Dr. James Tyson expressed himself as a firm believer in the Brand treatment of typhoid fever, which he contended is the only treatment that should be practised. The objections that have been raised and the difficulties that have been encountered are being gradually removed. The portable tub has made easily possible the employment of the treatment in private practise. In

hospital practise the mortality has been reduced to seven per cent. and even less. It would seem that something is gained by the reduction of temperature effected by the bath, though this is not the most important result. The almost total absence of stupor, of delirium, and of other symptoms suggestive of a typhoid condition is a striking feature in cases treated with the cold bath, the effect of which is, as has been said, to make every case of typhoid fever a mild case.

"In closing the discussion, Dr. Baruch repeated the statement that the primary object of the cold bath in the treatment of the febrile process is not the reduction of temperature."

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**Treatment of Granular Ophthalmia and Some Other Ocular Affections by Applications of Iodine in Liquid Vaseline.**—Dr. E. A. Neznamow, privatdocent of ophthalmology at the Medical Faculty of Kharkow, has employed a new method of treatment in trachoma, from which remarkably good results appear to be obtained. This treatment consists in applying twice a day to the mucous membrane of the everted eyelid a solution of pure iodine in liquid vaseline.

The applications are made with a brush or small cotton swab steeped in the solution, the strength of which varies according to the particular form of the affection in each case.

In the chronic, cicatricial varieties of granular ophthalmia, complicated by pannus, infiltration, ulceration, and superficial opacities of the cornea, Dr. Neznamow employs liquid vaseline containing from one half to one per cent. of iodine. By this means marked improvement is obtained within three or four days; in two or three weeks the vessels of the pannus become obliterated, the exudations are absorbed, the cornea recovers its transparency, the palpebral mucosa becomes smooth and soft; and as a result thereof, sight is improved.

The so-called pannus cornosus or crassus is said to yield with surprising rapidity to applications of liquid vaseline containing one and one-half per cent. of iodine. In the case, for instance, of a patient in whom two thirds of the cornea was covered by a pannus at least half a millimeter in thickness, the left eye after three weeks' treatment presented no abnormal symptoms except slight, superficial opacity of the cornea, while the pannus which remained in the right eye was insignificant.

In recent granular and papillary pannus it is necessary, in order to obtain the desired result, to increase the quantity of iodine in the solution to three or even five per cent. Liquid vaseline, however, does not dissolve more than one and one-half per cent. of this substance, and it must therefore be mixed with a little sulphuric ether or, better still, rectified petroleum, in sufficient quantity to insure the required concentration of the solution.

Applications of these strong solutions to the palpebral conjunctiva, as a rule, determine rather intense phenomena of reaction. The mucosa assumes a red tint, more or less profuse lachrymation supervenes, and the patient experiences a smarting pain, which, however, speedily subsides. After four or five applications, a catarrhal state is induced, with copious secretion, congestion and slight swelling of the mucosa. At this stage of the treatment, Dr. Neznamow, while continuing the iodine applications two or three times daily, slightly cauterizes the conjunctiva now and then with a two per cent. silver nitrate solution, followed immediately by irrigation of the eye. In addition, the largest granulations are incised, and their contents squeezed out. By these means the granulations become absorbed within a fortnight or three weeks.

In cases of recent trachoma, in which the secretion is profuse from the onset, it is advisable, before resorting to the use of strong iodine solutions, to make a few applications of glycerin containing five tenths per cent. of iodine, in order to check the hypersecretion of the palpebral conjunctiva.

The excellent effects of the treatment introduced by Dr. Neznamow have been confirmed by Dr. L. L. Hirschmann, professor of ophthalmology at the Medical Faculty of Kharkow, who has found that applications of iodized liquid vaseline may be employed with advantage, not only in granular ophthalmia, but also in certain other ocular affections.

Thus old-standing ciliary blepharitis is said to rapidly improve under application to the edge of the eyelids of a five tenths of one per cent. solution of iodine in liquid vaseline.

Instillation into the conjunctival cul-de-sac of a few drops of the same solution are also said to give very good results in cases of dacryocystitis.

Lastly, persistent infiltration following parenchymatous keratitis is said to be rapidly absorbed under the influence of applications to the palpebral conjunctiva of two, three, or five per cent. iodized liquid vaseline.

Solutions of iodine in liquid vaseline, obtained by the addition of sulphuric ether or petroleum, should be kept in tinted, well-stoppered vials, so as to exclude air and light. They remain clear for about a week, after which they become cloudy and unfit for use. — *Medical Week.*

**Cold Bath in Typhoid Fever.**— At the French Congress of Internal Medicine held last year, Glenard extolled the use of the cold bath in typhoid fever, it having been proven by twenty years' experience in France to be nearly a specific for this disease. Moussons recommends, besides the cold bath, an enema of cold boiled water twice daily, and free water-drinking.

**A Novel Remedy for Hay Fever.**— Fuber recommends rubbing the ears as a means of relieving congestion of the mucous membrane of the nose present in hay fever. He has observed that when there is a fulness and obstruction of the nostrils, the ears are pale. To afford relief they must be rubbed repeatedly, and each time until they are red and hot.

**The Prevalence of Tuberculosis.**— Examinations which have been made at the morgues in France have shown that fifty per cent. of all persons dying in that country have been more or less infected with tuberculosis.

**Toxic Effects of Theobromin.**— M. Huchard recently reported to the French Society of Therapeutics (*La Press Medicale*, Jan. 18, 1896), the results of late experiments as to the effects of theobromin upon animals and human beings. In relation to the chemical properties of theobromin, Huchard remarks that it is a dimethylate of xanthin, while caffein is a trimethylate of xanthin, and that the chemical compounds of these substances belong to the uric acid series. Among the toxic symptoms observed as the result of the administration of theobromin, Huchard mentions headache, which begins first in one temple, then extends to the other, finally affecting the whole head. Nausea, vomiting, and cerebral excitement bordering on delirium, were also noted. In cases of disease of the kidney, there was a decided increase in the amount of albumin present.

Theobromin is the active principle of cocoa, chocolate, and allied preparations. The above facts show very clearly the possibility of serious injurious effects from the use of these beverages. When it is remembered that caffein is closely allied to theobromin, and is also related to the same group of leucomains,— a fact pointed out by Lehmann, the great German chemist and physiologist when this drug was first discovered,— it must readily be admitted that tea and coffee, as well as cocoa and chocolate, are capable of decidedly harmful effects, especially in persons suffering from uric acid diathesis. Neurologists have already described the tea-drinker's disorder. Perhaps we shall soon have the cocoa-drinker's disorder.

**Auscultation of the Joints.**— Sir Benjamin Ward Richardson, who has contributed to rational medicine so many valuable ideas, has discovered that auscultation of the joints is a procedure almost as useful as the application of the same method of examination to the chest. He divides the sounds which are to be heard in the joints into five classes : —

1. Simple dry friction.
2. Dry grating.
3. Coarse grating.
4. Moist crepitant.
5. Coarse crepitant.

A healthy joint gives rise to a muffled or cushioned sound.

EXPERIMENTS by Dr. Bertrand have shown that the blood of the viper contains its venom, but it also contains an antitoxin which is a specific against the venom. By heating the blood, the toxin disappears at a temperature which does not affect the antitoxin, and this, when injected into the circulation of any animal, is capable of immunizing it against the poison of the viper.

**Physical Signs in Diseases of the Stomach.**— Drs. Hayem and Léon, who have pointed out anew the peculiarities frequently met with in gastric affections, state that inspection alone is often of decided value in establishing a diagnosis. These French observers inform us that —

1. Prominence of the abdomen in the upper part is seen in large eaters, such as diabetics.

2. Prominence below may occur in many conditions, as in women who have borne many children, in gastroptosis, etc.

3. A central prominence, extending from the lower part of the sternum to below the umbilicus, is seen after a full meal in patients with pronounced dilatation without ptosis of the stomach.

4. Flattening of the abdomen, with hypogastric prominence, occurs in those having dilated stomachs with ptosis. A slight transverse ridge may often be seen, corresponding to the lesser curvature of the stomach. The abdomen observed in profile may show: (1) A substernal hollow; this occurs in inanition, frequent vomiting, etc. (2) An abnormal prominence, mostly substernal or epigastric, due to distention of the stomach. (3) A flattening of the epigastric region, with hypogastric prominence, seen in gastric dilatation with ptosis.— *Medical Record.*

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**Chloroform Anesthesia Dangerous to Meat-Eaters.**— Some time ago Dr. Lauder Brunton called attention to the fact that death from chloroform anesthesia is probably due, not to the chloroform itself, but to the fact that chloroform arrests the elimination of tissue poisons, and that death is directly the result of the action of these poisons rather than of the chloroform. Dr. Brunton cited the fact that death from chloroform anesthesia is very rare in India, while it is becoming more and more common in England, which fact he attributes to the increasing use of meat as an article of diet in Great Britain.

Chloroform has long been a popular anesthetic in Edinburgh, but recently deaths from its use in that city have been very frequent. It is also noticed that gout is becoming very common. Both these circumstances are doubtless due to the increased consumption of meat resulting from the large importation of low-priced refrigerator meat.

In an interesting article in the *Sanitarian* for December, Dr. Chancellor describes the mud treatment at Acqui. The baths are administered there in a manner different from that employed at Homberg and other places. The mud is very adhesive and tenacious. This is daubed upon the affected part instead of being applied to the whole body, as is usually done. The patient is made to perspire freely for half an hour, and then takes a hot sulphur bath, after which the mud is washed off, and he retires.

This description would seem to suggest that the mud bath at Acqui consists simply of clay poulticing.

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**Massage in Fractures.** — M. Lucas Championnière has for several years advocated very enthusiastically the employment of massage in fractures, almost to the exclusion of other methods of treatment. M. Degoud recently advocates (*Semana Medica*) the employment of massage, combined with bandaging, and without any sort of immobilizing apparatus, and declares that by this method the treatment is greatly simplified, and recovery occurs more promptly and with less complications than by any other method.

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**Dry Regimen in Ascites.**— M. Finsen reports complete relief of a number of cases of ascites by the use of a dry regimen. The patient is allowed to take but four hundred grams (about thirteen ounces) of liquid in twenty-four hours. For the first three or four days, the patients suffered much from thirst, the tongue was dry, the saliva had a saltless taste, and much inconvenience was experienced; but at the end of that time the urine, which had previously been scanty, became abundant, and the ascites rapidly disappeared. The discomforts also disappeared. The ascites did not return as long as a moderately dry regimen was maintained, but increased when copious water-drinking was allowed.

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**A Wonderful Record.**— Malthe reports one hundred and fifty ovariotomies, with only three deaths, including one in which the operation was performed when the patient was moribund. Chloroform was invariably employed, being considered less dangerous than ether.

**Tuberculosis from Milk.**— The *Boston Medical and Surgical Journal* reports a case in which a young man contracted tubercular disease by drinking milk from a herd of cows, fifty-nine of which were afterward found to be tuberculous, and destroyed on that account. Two persons employed in making butter from the same herd, and who drank large quantities of milk, also suffered from the same disease.

**Auto-Intoxication in Burns.**— Drs. Boyer and Guinard (*Gaz. Med. di Roma*) have made extensive experiments upon dogs for determining the effects of burns produced by boiling water and otherwise. They found the first effect to be a lowering of the temperature in blood-pressure or shock. The second stage was marked by a rise of temperature, diarrhea, vomiting, delirium, convulsions, and exhaustion. Hyperemia of the brain, lungs, liver, kidneys, and other parts was also noted in this stage, together with other symptoms observable in toxic fevers. Examination of the urine showed a marked increase of toxicity, it being so great in some cases that injection of the urine in the quantity of nine to twelve cubic centimeters per kilogram of rabbit was sufficient to produce death. The symptoms noted as the result of the intravenous injection of the urine were torpor, contraction of the pupil, exophthalmos, dyspnea, with recurring spasms and convulsions.

Similar results were obtained from experiments with the urine of men suffering from extensive burns. It is evident that a great quantity of toxins is generated in the system of a person who has been extensively burned. These may be derived from the disintegrated tissues, and from changes in the fluids of the body and especially in the blood, as has been noted by many observers. Examination of the gases of the blood shows arrest of tissue metabolism. From these observations it is clear that in the treatment of burns the most important therapeutic indications are: —

1. To repress, so far as possible, the development of toxins by antiseptic management of the wounds.

2. To aid elimination of toxins by maintaining activity of the bowels and kidneys.

3. The introduction of oxygen into the system. The most convenient method of accomplishing this is by inhalation. The writer has observed, however, in experiments the results of which were published some years ago, that oxygen may also be introduced by the rectum, considerable quantities of it being completely absorbed by the alimentary canal if retained for a sufficient length of time. The latter method is likewise most economical, as it utilizes the entire amount of oxygen employed, whereas experiments have shown that even when pure oxygen is inhaled, the quantity absorbed is not very greatly above that taken up by the blood when ordinary air is inhaled.

**Nephrorrhaphy.**—Brien, of Lyons, by experiments upon a dog, has shown that the capsule of the kidney may be made to adhere to the parieties by exposure under a simple antiseptic dressing, which he considers preferable to perforating the parenchyma with sutures, although catgut sutures seem to be entirely harmless.

**Posture Cure of Enuresis in Children.** — Stumpf recommends that the child sleep with the hips elevated, as by placing two hard pillows under the thighs. His theory is that by this position the urine is prevented from entering the urethra.

**The Cryptoscope.** — Professor Salvioni, professor of physics at an Italian university, has discovered a means by which the "X" ray can be used without the intervention of photography, for the examination of the bones of the hand for the location of a bullet, etc.

**Ice in Asphyxia.**— Dr. Beer recommends the application of ice to the mucous membrane of the lips and mouth at the rate of normal respiration as an excellent means in asphyxia. This measure may well be tried, in connection with others.

**Alcoholic Neuritis.**— Dr. Maude recently reported, in *Brain*, a fatal case of neuritis which was evidently due to beer-drinking, and which sustains the views of Dr. James Ross, who held that beer is most likely to produce neuritis.

**Treatment of Flatfoot.** — Hoffa, professor of surgery at Würzburg, recommends the energetic massage of the leg and of the sole of the foot, with exercise taken in an erect position, the toes touching, and the heels as far apart as possible. The order of the movements in the exercise is as follows: Raise the heels, flex the knees; then extend the knees and sink the heels, repeating. In standing and walking, the inside of the foot should be elevated as much as possible. The feet should be kept as nearly parallel as possible in walking. Do not allow the foot to rest upon the whole plantar surface at any time. Wear a metallic in-sole so shaped as to raise the inside of the foot and give it its natural arch.

**For Granular Ophthalmia.** — Prokopenko administers massage to the eyelids by means of a glass rod with a rounded end. This is applied quite vigorously to the internal surface of the lids and the affected portion of the globe of the eye. After the massage, sulphate of copper is applied to the mucous membrane of the lids. A cure is effected in a few weeks without scars or retractions.

**Church Colds.**— The *British Medical Journal* calls attention to the fact that colds and resulting chronic catarrhs are frequently due to exposure in a damp, chilly church after the person has become heated by rapid walking. The bad methods usually employed in heating and ventilating churches increase the danger.

**Relation of the Acidity of the Stomach Fluid to the Urine in Healthy Persons, in Normal Digestion and Indigestion.**— Matthieu and Treheux (*Arch. Gen. de Med.*), made an extensive investigation for the purpose of determining the relation of the acidity of the urine and the gastric contents. In all these cases hydrochloric acid was present in excess. The conclusions arrived at were as follows:—

1. There is a definite relation between the acidity of the gastric contents and the urine.

2. The greater the acidity of the gastric contents, whether the result of secretion or fermentation, the greater the amount of acid eliminated through the kidneys.

3. The acidity of the urine usually falls during the first three to five hours after eating, and then increases.

4. If the acid is withdrawn from the stomach, the acidity of the urine falls, and it may become alkaline.

5. Less acid is eliminated through the urine in hypochlorhydrie than in hyperchlorhydrie.

6. The use of milk increases the acidity of the urine, owing to the fact that it gives rise to the production of lactic acid in the stomach.

7. It is not possible to determine the chemical condition of the stomach by examination of the urine.

8. Milk must be excluded from test meals, in pursuing this study.

9. Persons made the subjects of experiment should have a constant dietary during the investigation and for some time before.

**Uric Acid Diathesis.**— The increasing prevalence of uric acid diathesis, with the numerous nervous and other grave maladies which have been correctly attributed to it, has led to the careful study of the subject by a large number of persons. A writer in the *Medical Record* has estimated that the ordinary individual subsisting upon a mixed diet takes into his system at least three grains of uric acid daily, in addition to the amount generated within his own body. To avoid taking in this subtle poison, the writer recommends the entire disuse of beef extracts, soups and broths, fish and meat, as well as tea and coffee.

**Ulcer of the Leg.**— Dr. Chauffard treats chronic ulcers of the legs by covering them thickly with powdered sugar, retaining it in position by means of a proper dressing. The application is first made every day, then every other day, and later at longer periods, until the ulcer is healed.

**Washing with Oil in Eczema.**— Mr. Phillips, surgeon to the Birmingham Skin Hospital, recommends the use of olive-oil in eczema as a substitute for water. He has seen obstinate cases rapidly cured by this means alone.

# BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE AND BACTERIOLOGICAL REVIEW, from original sources.]

**The Transmission of Microbian Disease through the Medium of Books.** — M. du Cazal and M. Catrin recently published in the *Annals de l'Institut Pasteur* the result of a series of experiments for the purpose of determining to what extent microbian disease is transmitted by books. He found positive evidence of the transmission of streptococcus, pneumococcus, and Löffler's diphtheritic bacillus. It was found impossible to transmit tuberculosis to animals by means of paper heavily charged with Koch's bacillus, — a curious fact, the explanation of which does not yet appear. The observations were also negative as regards the typhoid bacillus. According to the *Revue Internal de Med. et de Chir.*, the typhoid bacillus may be distinguished in the evacuations and secretions, and differentiated from the coli bacillus within twenty-four to forty-eight hours by the following method described by Elsner: A culture medium is prepared by means of gelatin boiled with a decoction of potato, to which is added a solution of soda in sufficient quantity to produce a degree of acidity equal to that of Holtz's medium. This solution is filtered and sterilized. The liquid is then poured into Eslen and Meyer's tubes, and completed by the addition of iodide of potassium, in the proportion of one part to one hundred. The culture is then inoculated, and poured out on plates. The bacillus coli and the typhoid bacillus are the only microbes which will grow in this medium. Within twenty-four hours, colonies of bacilli coli appear in luxuriant brownish growths; twenty-four hours later the typhoid bacillus develops. This germ is easily distinguished as small, finely granulated, transparent points.

**Serum in Tuberculosis and Syphilis.** — Richet recently reported to the Society of Biology the result of interesting researches respecting the relation of serum to tuberculosis and syphilis, from which it appears that the serum of animals inoculated with tuberculin invariably contains toxic substances, while the milk of such an animal is free from toxins. Ordinarily, normal serum, when injected into an animal, has the effect to retard the tubercular process. In some animals, at least, microbic serum may prevent the development of tuberculosis. Tabetic symptoms arising from syphilis rapidly disappeared under the influence of injections of serum from a dog inoculated eight days previous with the blood of a syphilitic.

**Bacteria of the Genital Tract.** — Stroganoff (*British Medical Journal*) has conducted in the Helana Paolona Hospital in St. Petersburg, a series of experiments for the purpose of determining to what extent the genital canal in women is protected by nature from the invasion of microbes. Careful bacteriological examination of mucus obtained from the higher and lower parts of the genital tract showed that while the vagina contains living microbes, none are present in the healthy uterus in either pregnant or non-pregnant women. The cervical mucus was found to possess powerful germicidal properties.

**The Bacteriology of Arrow Poison.** — The natives of the New Hebrides render themselves a terror to their enemies by using poisoned arrows, the tips of which they smear with earth from certain marshes. M. Dantec has made a bacteriological study of these poisoned arrows, and finds that their fatal properties are due to the presence in the earth with which they are smeared, of two deadly germs, — a septic vibrione, and the microbe of tetanus. The first of these produces death from malignant edema in twelve to fifteen hours. In cases in which a septic vibrione has lost its virulence, the tetanus bacillus which is present proves equally, although less speedily, fatal. This observation of M. Dantec proves the incorrectness of the former theory that the tetanus bacillus is derived from a horse, since this animal is unknown in the New Hebrides Islands.

**The "X" Ray Not Antiseptic.** — Dr. Lyon, of London, exposed cultures of diphtheria bacilli to the influence of the "X" ray for twelve hours, but without any effect upon their development.

**Coffee and Disease Germs.**— A year ago, a Russian bacteriologist made some experiments for the purpose of determining the influence of coffee in destroying disease germs. The conclusion was that coffee is to some degree a disinfectant. The disinfectant properties of coffee depend, however, not upon the active principle of coffee, or caffein, which it contains, but upon the substances developed in the roasting of the coffee. It was found that the various substitutes for coffee are also germicides, and, like it, develop disinfectant properties during the roasting process. A watery infusion of either coffee or its substitutes was found to be capable of killing the germs of cholera within a few hours, and of typhoid fever in a somewhat longer time.

The conclusion should not, however, be drawn from these statements that either coffee or its substitutes are to be considered of value on account of their slight antiseptic properties, as too long a time is required for the destruction of germs by them.

**The Blood in Sarcoma.**— Motz has recently made some interesting investigations of the blood in cases of sarcoma. He finds in cultures made from such blood a very small micrococcus, anerobic in character, staining with difficulty. This peculiar microbe was found in eleven out of twelve cases. A negative result was obtained in the inoculation of animals. He draws from these observations the conclusion that sarcoma is an affection of the blood, localized primarily in the walls of the capillaries, and giving rise to thrombosis of the affected vessels.

**Rough-and-Ready Bacteriology.**— The *British Medical Journal* prescribes the following method of making a bacteriological diagnosis of diphtheria when ordinary laboratory facilities are not at hand: —

"When ordinary facilities for bacteriological investigation are not available in the diagnosis of diphtheria, Wright and Semple recommend for the preparation of a satisfactory culture-medium the use of a small quantity — say half a teaspoonful — of antitoxic serum, or, if this be not at hand, white of egg, which is introduced into a small, wide-mouthed bottle. The latter is placed in a horizontal position, and its contents coagulated over steam. Any water of condensation is poured off, and the culture-medium is permitted to cool. The inoculation is made by passing lightly over the surface of the medium a stout wire or glass rod which has been brought in contact with the diphtheritic throat. The stopper is to be replaced and the bottle kept as nearly as possible at blood-temperature. If this is not attainable, the temperature of an inside pocket will generally suffice. The microscopic examination may be undertaken after twenty-four hours have elapsed. The material for examination is obtained by lightly scraping the surface of the culture-medium with a platinum wire."

**The Bacteriology of the Eye.**— Bach has recently obtained, by experiments on both men and animals, phlyctenular inflammation of the eye by inoculation with staphylococcus pyogenes aureus, using a small lancet. The disease set up is entirely analogous to eczema of the skin, and is produced in the same way. Bach was of the opinion that these germs cannot obtain a foothold in the eye except as they lodge upon a raw surface, the resistance of which is, of course, greatly lowered.

**The Bacteria of Scarlatinal Sore Throat.**— Dr. Lemoine reported to the Medical Society of the Hospitals of Paris, the results of a painstaking examination of one hundred and seventeen cases of scarlatinal sore throat. The doctor found streptococci in all the cases. In one hundred and two cases, a pure culture was obtained. Staphylococci were found, and bacillus coli in two cases. The Löffler bacillus was found in eight cases.

**Serum Therapy for Cobra Bite.**— The Pasteur Institute has succeeded in preparing a serum which is found to be a perfect antidote for the dreaded cobra bite. A supply of this serum recently sent to Agra proved a successful remedy against the cobra bite in both men and beasts.

M. BOURNAY has shown that the fecal matters of a herbivorous animal fed on hay with which dry tubercular matter has been mixed, contain tubercle bacilli.

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## A LEAN PEOPLE.

AMERICANS are proverbially a dyspeptic race, with a few exceptions now and then among city aldermen, plethoric judges, and doctors who do a consulting practise, the total number of whom is not sufficient, however, to bring the average up to the normal standard. Leanness is due to the inability to digest and assimilate fat-making food. The non-digestion of starch is unquestionably one of the most common causes of disordered digestion. This is doubtless the chief cause of the extensive use of beef and other forms of flesh food in this country. Meat is readily dissolved in the stomach, and its digestion is not accompanied by the flatulence, acidity, and other distressing symptoms present in amylaceous dyspepsia. A beef diet is the most ready means of obtaining relief from these annoying symptoms, and hence is one of the most common diet prescriptions made by physicians, and one which is perhaps more frequently than any other made use of by patients for themselves. The result is relief from a certain set of symptoms, but at the same time the development of others which, if less disagreeable, are in the end not less serious. An exclusive meat diet robs the system of its proper supply of fat, and overwhelms the body with a great quantity of ptomains, leucomains, and tissue-poisons, which decrease the resistance of the body to disease.

Bouchard, Rogers, and others have shown that the poison-destroying function of the liver depends upon the amount of glycogen which it contains. This is almost exclusively derived from the starch of farinaceous foods; hence a person who, in consequence of inability to digest starch, confines himself largely to a meat diet, is exposed to a double injury, — the introduction of toxic substances into the system, and the lessened ability to destroy toxins and ptomains.

The dyspeptic who is suffering from the inability to digest starch, in exchanging a farinaceous for a flesh diet, simply exchanges one class of morbid conditions for another, the biliousness, or general toxemia, the uric acid diathesis, and the resulting rheumatism, neurasthenia, and allied conditions which proceed from a meat diet, being far more serious in their ultimate effects than the acidity, flatulence, and other annoying symptoms experienced from the indigestion of starch. The fermentation of proteids in the stomach, intestines, and colon, which always accompanies a flesh diet, produces toxic substances of a peculiar character, while the fermentation of starch results in the formation of acids and gases which are annoying and irritating, but not to any degree toxic. A certain amount of fat in the tissues is necessary as an aid to vital resistance. The excessively lean as well as the overfat person is more liable to attacks of disease than the person who possesses a normal amount of adipose tissue. Starved pigeons can be readily infected with certain microbial maladies against which they are found to be proof when well fed.

The substitution of a meat diet for one consisting of farinaceous foods, while a convenient mode of dissipating certain unpleasant symptoms, is, nevertheless, not the best remedy for this condition. What the patient requires is not the withdrawal of starchy foods, but the ability to digest them. In extreme cases, starch

may be temporarily administered in a digested state, as is offered in various malted extracts,—maltine, bromose, malted milk, and similar preparations.

## THE COLOCLYSTER.

SEVERAL years ago the writer coined the term "coloclyster," to indicate an enema administered in such a manner as to fill the entire colon. This treatment may be given as suggested by the late Dr. Jewell, of Chicago, with the patient in the knee-chest position, or lying upon the right side, turned slightly upon the face, and with the knees well drawn up. We have used the coloclyster in this manner in some hundreds of cases, and often with most remarkable results.

The indications for a coloclyster, or irrigation of the colon, were recently very well summed up by Dr. T. M. Burns, in the Denver *Medical Times*, as follows: —

1. Constipation.

2. Colic, intestinal obstruction, sick-headache, acute fever of any sort, peritonitis. To be repeated every two to four hours until the bowels are thoroughly moved.

3. Fecal impaction.

4. Diarrhea or dysentery, using pure cold water.

5. Chronic dyspepsia, consumption, pneumonia. At bedtime, two or three times a week.

6. Disease of the kidneys. The application may be made at night, a pint of water being slowly introduced and retained, after the discharge of that which was first administered.

7. Cases of uterine disease in which the vaginal douche cannot well be employed, as in young girls.

8. Hemorrhoids, using cool or cold water.

9. Skin diseases, and many other forms of chronic maladies.

We have employed the coloclyster for all the above purposes, and, in addition, have found it exceedingly valuable in cases of salpingitis or so-called cellulitis, as well as an excellent means for relieving menstrual pain. It is also valuable in chlorosis, in infectious jaundice, chronic toxemia, migraine, and, in fact, in nearly all chronic maladies, most of which are now recognized as being due to the accumulation of toxic poisons within the body, arising either from absorption through the alimentary canal, or through imperfect oxidation of tissue wastes, or from both causes, the renal elimination through the kidneys being insufficient to maintain blood purification. The coloclyster is the most valuable of all diuretics in Bright's disease and in cases of renal suppression from any cause, also in obstinate vomiting in which fluids must be withheld.

The coloclyster may be used as a means of introducing water into the system. We have constantly used it in this manner in cases of abdominal section. The temperature of the water employed may vary from that as hot as can be borne, for the relief of pelvic pain and inflammation, and in cases of fecal impaction, to ice-water.

In dysentery and bleeding hemorrhoids, the coloclyster is best administered with a common syringe. The height of the fountain should be such as not to allow the water to enter so rapidly as to produce colic pains. Care must be taken to avoid introducing air.

Patients sometimes complain of exhaustion following the use of the enema. In these cases there is abnormal sensitiveness of the abdominal sympathetic. The enema should not be administered too frequently. Inactivity of the bowels sometimes results from the habitual use of the enema. It is possible, also, for harm to arise from the use of too large a quantity of water, thus resulting in dilatation of the colon, especially where it is distended by accumulated fecal matters.

In such cases a small quantity of water, say one or two pints, should be employed, the water being used, if possible, with soap, and in very obstinate cases, with a very little turpentine added, ten to fifteen drops to the quart of soap-suds. The water introduced at first, should be retained for a little time, and then discharged, and another application of the same sort made, the quantity being gradually increased until the bowels are unloaded. The entire colon should then be thoroughly washed out.

In discontinuing the use of the enema, both the quantity and the temperature should be gradually reduced until the bowels move readily without the introduction of water.

**The Bacteriology of Milk.**— Professor Conn, of the Western University, has recently presented, in a report published by the United States Department of Agriculture, a summary of observations in relation to the bacteriology of milk.

Pure milk, as has long been known, drawn from a healthy cow, with proper precautions, contains no bacteria, but under ordinary conditions milk becomes infected with great numbers of microbes, which grow with astonishing rapidity. Professor Conn found that the milk obtained at Middletown, Conn., contained, within two or three hours after being drawn, from 330,000 to 9,000,000 microbes per ounce. The milk supply of Boston was found to be infected to a much greater degree, as many as 135,000,000 germs being found per ounce in some specimens. The milk of Madison, Wis., during the months of May and June, was found to contain 60,000,000 microbes per ounce.

The milk supply of European cities has been found infected to a much higher degree, the number of microbes being rarely less than 150,000,000 germs per ounce, and often reaching as high as 600,000,000, and sometimes the enormous number of 5,400,000,000 in a single ounce.

The number of different kinds of microbes found, varies from a half dozen or more to as many as fifty in a single locality. One German investigator found sixty-nine different kinds of microbes in a series of cheeses. These germs give rise to the so-called "ripening" of cheese, as it has been found that cheese cannot be made from boiled or sterilized milk. It is thus evident that "ripening" as applied to cheese is simply another name for decaying. The germs of tuberculosis, diphtheria, and typhoid fever are not infrequently found in milk.

**The Kola Delusion.**— The profession will some day repent the great confidence which is now being reposed in kola and like preparations. The therapeutic use of kola is based upon the claim that it gives increased capacity for work. The same claim has been made for extracts of cocoa or caffein, and for alcohol. It is claimed, however, that kola and allied drugs differ from alcohol in that, while alcohol gives a temporary disposition for increased effort, this effect is very quickly displaced by the opposite condition; in other words, the reaction after the use of alcohol is very rapid. Beef tea and beef extract have been recommended on the same grounds. A careful study of this question, however, will place before any intelligent physician sufficient evidence to convince him that all the claims made for these substances are without physiological foundation.

The late Professor Lehmann, the eminent German authority in physiological chemistry, called attention to the fact that caffein is closely allied to creatin and other tissue poisons, the accumulation of which within the body gives rise to loss of energy and the disposition to work. The late Dr. Edward

Smith has clearly shown that while tea and coffee produce a feeling of increased readiness for work, the fatigue experienced after the effort put forth under the influence of these beverages is far greater than that induced by the same amount of work performed without them. Beef tea, as recently remarked by a celebrated French surgeon, "is a veritable solution of ptomains;" and it has been shown by the experiments of Horsley and Ferrier in studying the motor areas in the brains of monkeys, that both beef tea and beef extracts are nerve poisons.

The analogy of kola to caffein has been very clearly pointed out by those who have made a study of it. This substance is, like cocain, opium, cannabis indica, and other allied drugs, simply what might be called a nerve-fooler, which abolishes the sense of weariness or fatigue, without giving any increased capacity for work, and without lessening the consequences of mental or muscular effort. In fact, there can be no doubt that the effort put forth under the influence of such drugs costs the body a greater expenditure of energy and vitality than the same amount of work performed under normal conditions. Nature cannot be swindled.

More damage than can be estimated is, in the opinion of the writer, being done at the present time by the use of kola preparations of various kinds. We are a drug-ridden people; and it is indeed a sad spectacle to see the medical profession lending themselves as willing tools to forward the schemes of manufacturing pharmacists.

**Bathing during Menstruation.**—The fear which many women have of contact with water, especially cold water, during the menstrual period, is wholly unfounded, provided the woman has been accustomed to bathing at these periods. The writer saw scores of women at work in the brickyards of Lye in the "Black Country" near Birmingham, Eng., whose feet were wet from morning till night, as they engaged in their work; nevertheless, they suffered no inconvenience in menstruation as the result of their exposure. The South Sea Island and other aboriginal women do not hesitate to plunge into cold water at the menstrual period as well as at other times. Houzel declares that any woman can bathe in cold water with impunity during the menstrual period, provided she has accustomed herself to this form of bath for a few days previous. He claims also that habitual cold bathing facilitates the menstrual flow, and increases fecundity.

**A Remarkable Man.**—Our old teacher, Professor Louis A. Sayre, of the Bellevue Hospital College, has recently celebrated his nineteenth birthday, at which time he had reached the advanced age of seventy-six years. Having been born on February 29, his birthday occurs but once in four years. Though old in years, Professor Sayre still carries a heart brimful of the milk of human kindness, and bids fair to finish the century.

**To Exterminate Cigarettes.**—The South Carolina House of Representatives has undertaken a war against the cigarette which is likely to limit the use of the nauseous weed in this form, if it does not eradicate it. A bill has been passed levying a tax of twenty-five cents on each package of ten cigarettes.

RECENT numbers of the *British Medical Journal* have contained many interesting "skiagraphs," as the impressions obtained with the "X" ray are now called. Bullets, needles, and other foreign bodies buried in the hands have been located by the new ray, and it has also been found useful in the diagnosis of disease. Our frontispiece shows two photographs taken by the Röntgen ray.

# REVIEWS.

THREE CASES OF CHRONIC ABSCESS OF THE BRAIN.— By J. T. Eskridge, M. D., Denver, Colo.

This interesting paper is accompanied by valuable cuts which show the exact location of the abscesses mentioned, and presents many points of unusual interest.

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AN INQUIRY INTO THE RELATIVE ADVANTAGES OF VAGINAL HYSTERECTOMY AND THE SUPRA-VAGINAL AMPUTATION OF THE CERVIX FOR CANCER OF THE CERVIX UTERI.— By A. H. N. Leweres, London.

The author reports forty-three cases, in twenty-six of which the cervix was amputated, and in seventeen the operation of hysterectomy performed. The author's statistics show a mortality of but six per cent., all the deaths having occurred in the cases of hysterectomy. One of the three deaths was from edema of the lungs, one from hemorrhage, and the third from peritonitis due to infection from the breaking down of protective adhesions on removing the pressure of the forceps. In reviewing the ultimate results, the author concludes that in cases in which any operation is likely to succeed, supra-vaginal amputation of the cervix affords as satisfactory results as does hysterectomy.

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SURGICAL TREATMENT OF HEMORRHOIDS.— By H. O. Marcy, A. M., M. D., New York.

Dr. Marcy has won deserved distinction as one of the leading surgeons of America, and has labored successfully in so many lines that it is difficult to say what is his specialty, if he has one. However, every one knows he has a hobby, and that is the use of the buried animal suture, which we think he may justly claim to have been the first to advocate. Certainly no one in this country has done so much as Dr. Marcy to keep before the profession the importance and value of the buried animal suture. Those who denounced this method ten or twelve years ago, are now falling into line, and making daily use of it, in consequence of the many advantages which it presents over non-absorbable sutures and ligatures. It is clear, from Dr. Marcy's paper, that he was the first to apply the buried suture treatment to hemorrhoids. Fifteen years ago he devised a method essentially the same, in principle, as that of Whitehead, which has been more recently presented to the profession. We agree with Dr. Marcy that this method is a valuable one, and that, when employed in appropriate cases, it presents an ideal manner of dealing with that troublesome and painful condition, external hemorrhoids. Many have been prejudiced against the method by the unfortunate results of clumsy operations which have been brought to their notice, or by lack of an understanding of its technique. This paper, like all of Dr. Marcy's productions, is interesting and instructive, both from a practical and a historical standpoint.

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THE TECHNIQUE OF THE BURIED ANIMAL SUTURE.— By H. O. Marcy, M. D., New York. D. Appleton & Co.

This is a paper read before the Surgical and Gynecological Association at its recent annual meeting. Dr. Marcy is certainly an authority upon this subject. His paper is interesting and practical, and gives just the information which the inexperienced surgeon requires. The safety of the animal suture, when used with proper precaution, is clearly demonstrated by Dr. Marcy's own statistics, which show six hundred cases of operation upon aseptic tissues, with the occurrence of only two cases of infection.

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THOROUGHNESS IN MEDICAL EDUCATION.— By Hunter Robb, M. D., professor of gynecology in the medical department of the Western Reserve University.

This is an address delivered at the opening of the session of the medical department of the Western Reserve University, Cleveland, O., September, 1895. The author makes a most earnest plea for the more thorough education of the physician, and for the elimination of the commercial spirit from the profession. We heartily echo the sentiment expressed by Dr. Robb in the following words, which are to be commended to every physician :—

"The true physician must always be capable of self-sacrifice, and every member of a medical faculty who has failed to learn this lesson, and who fails to enter upon his work of teaching in this spirit, is unworthy of his position. Each one should have the spirit with which St. Paul was imbued in the carrying on of his missionary work ; for we are missionaries, in another field it is true, and 'woe be unto us if we teach not' medicine."

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USE OF ANTITOXIC SERUM FOR THE PREVENTION OF DIPHTHERIA.— By Herman M. Biggs, M. D., New York City.

The author shows in this paper that by the use of antitoxin it has been found possible to completely stamp out diphtheria in four great institutions devoted to the care of children, in which it was prevailing in more or less epidemic forms. No harm was observed from the use of the remedy. The immunity induced was found to last, in many cases, not longer than thirty days. The paper is a valuable contribution to the literature on this subject.

The Battle Creek Sanitarium

# LABORATORY OF HYGIENE.

J. H. KELLOGG, M. D., Superintendent.
GEO. W. BURLEIGH, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
A. B. OLSEN, B. S., M. D., Pathologist.
W. A. GEORGE, M. D., Chemist.

**Monthly Résumé of Work Done.**

## REPORT OF EXAMINATIONS OF BLOOD.

FOR MARCH.

| Blood Count. | Men. | Women. | Total. |
|---|---|---|---|
| 5,000,000..... | 5 | | 5 |
| Between 4,500,000 and 5,000,000..... | 79 | 3 | 82 |
| " 4,000,000 " 4,500,000..... | 6 | 46 | 52 |
| " 3,500,000 " 4,000,000..... | 2 | 17 | 19 |
| " 3,000,000 " 3,500,000..... | | 1 | 1 |
| Totals..... | 62 | 67 | 159 |

| Hemoglobin. | Men. | Women. | Total. |
|---|---|---|---|
| 100 per cent..... | 35 | 4 | 39 |
| 93 " " ..... | 47 | 33 | 80 |
| 85 " " ..... | 8 | 23 | 31 |
| 78 " " ..... | 0 | 3 | 3 |
| 71 " " ..... | 2 | 4 | 6 |
| Totals..... | 92 | 67 | 159 |

**Gastric Laboratory Report for March.**— Total number of examinations, 172; experimental, 11.

The patients were from the following States and countries: Michigan, 80; Minnesota, 16; Illinois, 15; Indiana, 12; Ohio, 13; Iowa, 9; Wisconsin, 5; California, 4; West Virginia, 3; South Dakota, 3; Kansas, 2; Pennsylvania, 1; Nebraska, 1; Massachusetts, 1; Kentucky, 1; Vermont, 1; District of Columbia, 1; Idaho, 1; New York, 1; Canada, 2.

**Bacteriological Examination of Stomach Fluids.**— Number of examinations made, 164. Eight examinations were made for toxic products in stomach fluids containing liquefying germs; also fourteen examinations to determine the germicidal power of the stomach fluid.

**Urinary Analysis Report for March.**—Number of examinations made, 297; new cases, 228; number of specimens in which albumin was found, 13; pus, 68; sugar, 6; blood, 3; bile, 3; casts, 4. Number of cases in which the nitrogen coefficient was determimed, 2; determination of toxicity, 4.

**Microscopical Examination of Sputum for March.**— Total number of cases, 50; new cases, 37. Tubercle bacilli were present in 4 cases.

**Chemical Test for Lactic Acid in Stomach Fluids.**— Several hundred bacteriological examinations have now been made in this country, and comparison has been made between their results and those obtained from the chemical test for lactic acid as an index of the presence or absence of fermentation. It has been observed that in a considerable number of cases in which the most careful chemical test for lactic acid and other acids of the fatty series gave negative results, the bacteriological test showed the presence of a great number of acid-producing germs. In next month's issue we will publish a tabulated statement of these results, which will, we think, convince the most skeptical that the chemical tests for lactic acid now in use are wholly unreliable, except when enormous quantities of the acid are present.

**Bacteriological Examination of Milk.**— During the last year a number of observations have been made for the purpose of determining the number of germs to be found in milk produced under conditions of ordinary dairies. The milk from nine different dairies was examined, fourteen specimens in all, the samples being taken on different days, with the following results: —

| | | Liquefaction of gelatin. | Acid Fermentation. | Aerogenesis. | Number of germs per c. c. |
|---|---|---|---|---|---|
| A. | Sample 1, | Present | Present | Absent | 1,230 |
| A. | " 2, | " | " | " | 5,150 |
| B. | " 1, | " | " | " | 34,200 |
| B. | " 2, | Absent | " | Abundant | 14,100 |
| B. | " 3, | " | " | Absent | 1,010 |
| C. | " 1, | Present | " | " | 15,550 |
| C. | " 2, | " | " | " | 55,100 |
| D. | " 1, | Absent | " | Abundant | 78,000 |
| D. | " 2, | " | " | Absent | 13,520 |
| E. | | Present | " | " | 136,250 |
| F. | | " | " | " | 25,800 |
| G. | | Absent | " | " | 101,500 |
| H. | | " | " | " | 25,000 |
| J. | | " | " | " | 300 |

# PUBLISHERS' DEPARTMENT.

MODERN MEDICINE LIBRARY.— The publishers of MODERN MEDICINE will issue each month during the year 1896, under the above title, a brochure on some medical topic. The first number consists of a paper by Dr. J. H. Kellogg, entitled, "What is the Matter with the American Stomach?" which presents the results of new and interesting inquiries respecting the morbid conditions of the stomach, and their causes. $1.00 a year.

The following additional numbers are already in preparation: —

"The Liver: Its Diseases and Modern Methods of Treatment," by Dujardin-Beaumetz.

"Auto-Intoxication, and Its relation to Diet and Therapeutics," by Bouchard and Rogers.

"The Importance of Intestinal Asepsis and Antisepsis in Abdominal Surgery."

"Scoliosis: Its Etiology, and Rational Treatment by Massage, Swedish Movements, Gymnastics, and Electricity," by Dr. T. J. Hartelius, Director of the Central Institute of Gymnastics, Stockholm, Sweden.

"Diabetes: Its Causes and Successful Modes of Treatment."

"Enteroptosis, or Dislocation of the Abdominal Viscera, and Its Relation to Neurasthenia, Indigestion, Constipation, Rheumatism, Bright's Disease, and other Chronic Maladies; Its Cause and Rational Methods of Cure," by Trastour, Glenard, and others.

"The Value of Strength Tests in the Prescription of Exercise, and a Comparative Study of the Strength of Individual Groups of Muscles, and of Homologous Muscles, in Men and in Women," by J. H. Kellogg, M. D.

"The Malaria Parasite: Its History, Methods of Examination, Modes of Infection, and Modern Methods of the Treatment of Acute and Chronic Malarial Infection." Illustrated.

"Inebriety and Its Medical Management," by T. D. Crothers, M. D., Hartford, Conn.

Several of these brochures will be good-sized pamphlets, any one of which will be well worth the price charged for the entire series.

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SPECIAL OFFER TO NEW MEMBERS OF THE AMERICAN MEDICAL TEMPERANCE ASSOCIATION. —The Modern Medicine Publishing Company, publishers of the *Modern Medicine Library* (see above announcement), offer to send the *Library* at half-price, or 50 cents for one year, to all new members of the American Medical Temperance Association. Many of the numbers announced for the *Library* for 1896 are individually worth many times the yearly subscription price. Any person who desires to take advantage of this offer should enclose to the Modern Medicine Publishing Company, or to the Corresponding Secretary of the American Medical Temperance Association, Dr. J. H. Kellogg, Battle Creek, Mich., the sum of $1.50, which will entitle the sender to membership in the American Medical Temperance Association, on complying with the usual requirements (see *Bulletin of the American Medical Temperance Association*), and to a copy of the *Modern Medicine Library* each month for one year. For 50 cents additional, or $2.00 in all, the Modern Medicine Company will also mail regularly during 1896, or for one year, MODERN MEDICINE, a monthly journal which is everywhere recognized as in the front rank in scientific medicine. Each number is an interesting presentation of what is newest, brightest, and most useful in rational medicine and physiological discovery. Modern Medicine Publishing Co., Battle Creek, Mich.

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THE ANNUAL MEETING.— The annual meeting of the American Medical Temperance Association will be held at Atlanta, Ga., May 5–8. The annual meeting of the American Medical Association will also be in session at Atlanta during these days. The meetings of the American Medical Temperance Association, by invitation of the chairman, Dr. Chas. H. Shepard, will be held in connection with the section on State Medicine. All who are interested in the question of alcohol from a scientific standpoint should attend these meetings. A number of interesting papers are already promised.

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HONESTY IS THE BEST POLICY.— The man who sails under false colors is certain to be brought to judgment sooner or later. The Battle Creek Sanitarium Health Food Company, who have for more than twenty years been making a cereal substitute for coffee, have always taken care to tell the exact truth about the agreeable beverage which they prepare for the patients at the Battle Creek Sanitarium, as a means of winning them away from the use of those pernicious beverages, tea and coffee, which are responsible for many of the ailments from which the thousands of patrons of this institution are found to be suffering.

Within the last few years the facts with reference to the injurious effects arising from the use of tea and coffee have, through the influence of physicians everywhere, come to be so wide-spread as to create a great demand for wholesome substitutes for these harmful drinks. This has led different parties to place upon the market, under various names, cereal and other preparations intended to be used as beverages, in place of tea and coffee. Some of these contain a considerable amount of pyroligneous acid, a substance decidedly injurious to the stomach, and giving rise to nausea, indigestion, and other unpleasant results; but we know of none which are so bad in their effects as tea and coffee themselves, and therefore regard all these enterprises as more or less in the interests of dietetic reform, and not to be discouraged. It is right and proper, however, that the public should know the truth with reference to these beverages.

The Sanitarium Health Food Company, who were among the first, if not the very first, to place before the public a cereal substitute for tea and coffee, they having begun the manufacture of such an article nearly thirty years ago for the use of the patients of the Battle Creek Sanitarium, claim for their preparation simply that it is a wholesome and harmless beverage. They have never claimed that it is in any sense a food. For any one to make a claim of this sort is in the highest degree preposterous, and an insult to the common sense of the public.

In view of such astounding claims as have been made, it is not surprising that the food commissioner of Michigan, whose duty it is to see that the people of the State are not imposed upon by fraudulent foods, should consider it his duty to investigate

the claims made, and to place the results before the public, which he recently did in a very pungent manner.

While the commissioner erred in supposing these articles to consist of roasted barley, he was perfectly right in calling attention to the fact that they are not to be relied upon to make blood or to build up any other tissue.

Blood can be made only from food. It cannot be obtained from tea or coffee, or any cereal substitute therefor, but by the use of good, wholesome, digestible food. The food commissioner did not, as a matter of fact, tell the whole truth in relation to these beverages, as he gives them credit for a certain amount of nutritive value in consequence of the soluble matter which they contain, whereas this soluble matter is not food, or at least but a very small fraction of it is.

Let us stick to the truth. To say that a cereal substitute for coffee can be in any sense regarded as a food is as great a departure from the truth as to say that tea and coffee are innocent and harmless beverages. One untruth may do as much harm as the other, for while the believer in one statement would be poisoned, the dupe of the other might be starved to death; and of the two modes of death, the first would probably be generally considered the more agreeable.

The Battle Creek Sanitarium Health Food Company do not claim Caramel-Cereal to be a food, but that it is the most agreeable substitute for tea and coffee which has yet been discovered, and contains none of the harmful properties of these baneful drugs. It is an excellent accompaniment to the delicious health foods manufactured by this company, among which Granose and Granola are especially worthy of mention.

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DIET IN DISEASE.— No better illustration can be afforded of the importance now attached by physicians to the dietetic treatment of diseases in general than the multitude of food products in the market. As has been recently emphasized by Dr. Richy (*Daily Lancet*), in view of the abundance of such preparations, the physician's task becomes a hard one, and he must be as conversant with their composition and value as he is with the action of the drugs he prescribes. Unless careful discrimination be exercised in the selection of a food for the sick, only disappointment will be experienced. Milk, and even kumyss, which has been so highly lauded, are repugnant to not a few patients, or become so after being taken for a few days. With regard to the peptonized beef preparations, Dr. Richy states that he has entirely discarded them in his own practise, as their nutritive power is extremely feeble, and does not compensate for their abominable taste. He also calls attention to the fact that many authorities have relegated the peptonized and pancreatized products to the background, and contests their value as foods.

In Somatose he has found a preparation more nutritious than peptones and more digestible than the albumins, since it contains a considerable proportion of nitrogenous elements, principally in the form of albumoses and peptones. A personal experience with Somatose in a considerable number of cases of dyspepsia, leads Dr. Richy to regard it as a food which is well adapted to a delicate stomach not able to dispose of ordinary food, or of only a small quantity. In a case of typhoid fever with much gastric disturbance, this product was well relished when all other foods were refused, and excellent results were derived from its use in several other cases of this disease. A case in which the merits of Somatose were put to a severe test was that of a pregnant woman, who in consequence of constant vomiting, had been reduced to a wretched condition. Although the patient had refused food of all kinds, including kumyss, she at once took a liking to Somatose, the vomiting ceased, and she was soon able to dispose of more nourishment. In conclusion the author says that his results have been so satisfactory that he prescribes it with confidence, and feels justified in recommending it as a nutritious, pleasant, and digestible food preparation.

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## NUT BUTTER AND NUT MEAL.

It has long been a recognized fact that nuts contain a larger percentage of wholesome and nutrient material than any other class of foods. The great objection has been their comparative scarcity and their firmness of flesh, rendering mastication difficult. A nut when imperfectly masticated or otherwise reduced to a pulpy consistency, is almost indigestible, owing to the firmness of its structure. By a fortunate discovery, as the result of long and patient experimentation and investigation, a method has now been found whereby certain nuts—especially those which, like the almond, are capable of being blanched, thus removing the bitter, unwholesome, woody envelope—can be rendered easily digestible and capable of ready combination with other foods in a variety of ways. The most valuable products which have been thus far developed are **Nut Butter, Nut Meal,** and **Bromose.**

The special advantages of **Nut Butter** over ordinary butter, tallow, lard, cottonseed oil, cocoanut butter, olive oil, suet, cream, and other materials used for shortening foods, are the following: —

1. **Nut Butter** is a purely vegetable product, and hence free from the elements of disease which are often found to an extent dangerous to life in animal fats. Recent examinations made in Italy show that ten per cent. of ordinary butter contains the germs of tuberculosis, or consumption. Examinations made in this country have shown that American butter also contains tubercle germs. The germs of hog cholera and also those of other diseases have been found in lard. Cream of course contains the same germs as butter.

2. **Nut Butter** being perfectly sterilized, is free from germs of all kinds. Butter and cream, unless sterilized, always contain germs capable of setting up fermentation, putrefaction, and other morbid processes in the stomach. More than fifty different kinds of germs have been found in milk, cream, and butter. This is the principal reason why these substances disagree with so many stomachs, producing biliousness, headache, constipation, and other unpleasant symptoms.

3. **Nut Butter** is an emulsified fat. Nature has made no provision for the digestion of free fat in the stomach. Observations show that free fat in the stomach interferes very materially with the digestion of other foods, fat being digested only after the mass of food leaves the stomach, and enters the small intestine, where it is acted upon by the bile and pancreatic juice. Neither the saliva nor the gastric juice, which act upon the food in the stomach, has any influence whatever upon free fat. But emulsified fat dissolves in water, and hence readily mingles with the food without interfering with the digestion of other food elements. This objection holds against butter, suet, lard, cottonseed oil, olive oil, cocoanut butter and oil, peanut oil, and all other free fats, **Nut Butter** being the only vegetable product which is not open to it. It mixes readily with water, which no other substitute for butter will do.

4. **Nut Butter** used as a seasoning for vegetables or other foods imparts a rich, tasty, and meaty flavor, due to the large amount of osmazome contained in it, and to the fact that its composition very closely resembles that of fat meat, a large percentage of nitrogenous matter as well as fat being present.

5. **Nut Butter** is a complete food, not a condiment. While its chief component is vegetable fat, of which it contains forty-one per cent., it also contains a large percentage of nitrogenous, or blood-forming, elements. A pound of **Nut Butter** contains half as much fat as a pound of butter, and at the same time contains as much of the nitrogenous, or blood-forming, element as a pound and a quarter of beefsteak.

6. **Nut Butter** is not a mixture; it is a pure, natural product. It is a true food, the elements of which are formed in the laboratory of nature, and so modified by the process of manufacture as to be most readily and perfectly assimilated. It never produces biliousness, sour stomach, fermentation, heartburn, or any of the ill effects which follow the use of fat meats, oils, and animal fats.

7. **Nut Butter** may be safely eaten by invalids, and is admirably adapted for the use of all persons who need an increase in fat and blood. Numerous instances can be cited of persons who have gained one or two pounds a week by its use. It increases flesh not only by its own nutritious properties, but by assisting the digestion and assimilation of other foods.

8. **Nut Butter** is by many persons found to be a perfect remedy for chronic constipation or inactivity of the bowels. Nuts have long been known to be useful for this purpose, but the difficulty of digesting them in their ordinary form has prevented their general use. The production of nut butter and nut meal has solved this problem.

9. What has been said concerning **Nut Butter** may be said also respecting **Nut Meal**, the difference between the two products being that **Nut Meal** contains a larger percentage of the blood- and tissue-forming elements (thirty-one per cent.) and a smaller proportion of fat (forty per cent.).

10. **Nut Meal** may be eaten in a great variety of ways. It is delicious in the form of gruel, or purée. Combined with fruits in various ways, it is delicate and wholesome.

**Bromose** is a combination of nuts with digested starch. It is the vegetable analogue of malted milk, and constitutes a perfect food. It has all the advantages over animal fats presented above, and in addition, the advantage that it contains a full assortment of all the food elements which are most difficult of digestion (starch and fat) in a predigested state, and ready for prompt assimilation.

**Bromose** is not intended to be used as a condiment or seasoning, but as a food. Used freely, it is not only delicious and palatable, but is perhaps the most easily assimilated, the most strengthening, and the most fattening of all foods. The writer often makes a breakfast of a dozen small cakes of **Bromose** and three or four apples, and has the satisfaction of knowing that with such a breakfast he will not only be able to enjoy a clear head, but a maximum of vigor and energy; and that if duty should require such unremitting attention as to afford him no opportunity to eat again until the next day, no special inconvenience or harm would be suffered in consequence.

A pound of **Bromose** contains emulsified fat equivalent to more than half a pound of butter. It contains, in addition, albumin in precisely the same amount as a pound of beefsteak. In other words, a pound of **Bromose** contains as much beefsteak as a pound of beefsteak. It contains, in addition, the strengthening and sustaining elements of one and one-half pounds of bread. It thus combines all the nutrient qualities of bread, beef, and butter, and has the advantage over all of them, that, being predigested, it is ready for prompt assimilation, and being also thoroughly sterilized, it promotes a healthy condition of the stomach. It does not disagree with the most delicate digestive organs.

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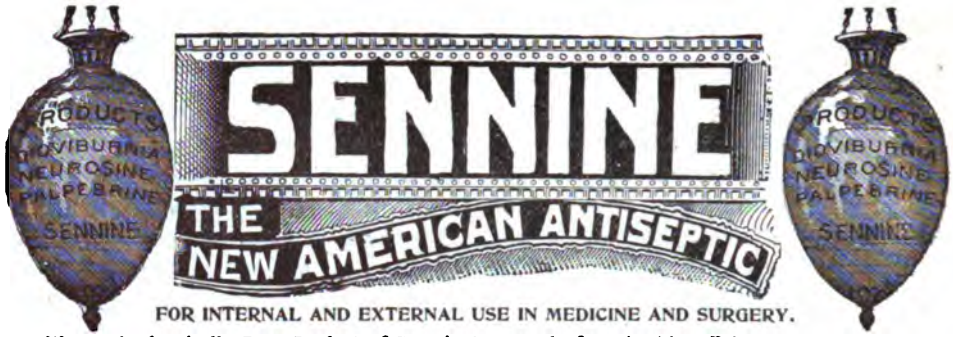


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JOHN B. JOHNSON.

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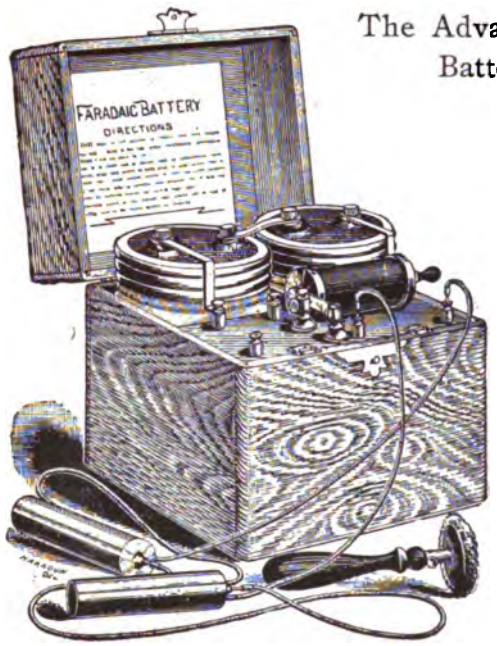


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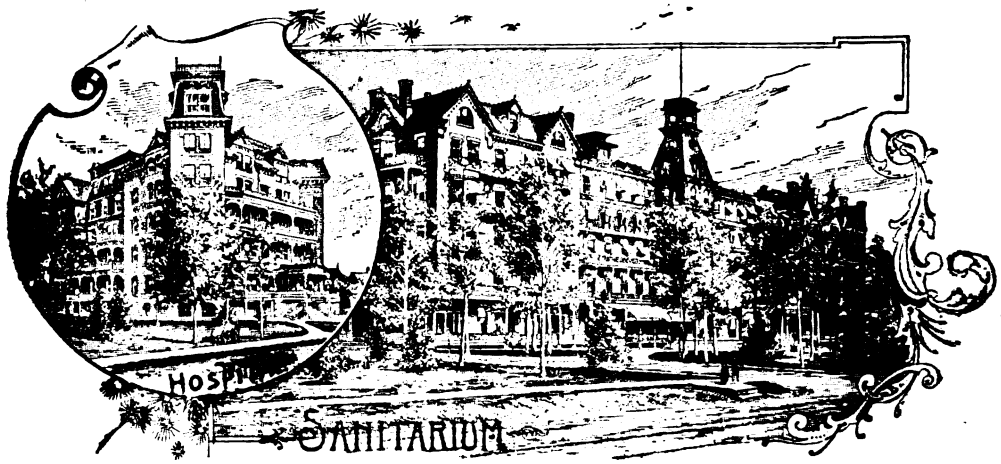


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Bulletin of the Sanitarium Hospital and Laboratory of Hygiene.
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|---|---|---|---|---|---|---|---|---|---|---|
| 10 Mail Ex. | 4 L't'd Ex. | 6 Atl. Ex. | 42 Mixd Tr'n. | 2 Pt. H Pass | | 11 Mail Ex. | 1 Day Ex | 3 E'd L't'd | 23 B. C. Pass. | 5 P'ke Ex. |
| a m | p m | p m | | | | p m | p m | p m | | a m |
| 9.00 | 3.10 | 8.15 | a m | ..... | D. Chicago. A | 6.45 | 1.50 | 9.10 | ..... | 6.30 |
| 11.25 | 5.05 | 10.30 | 6.00 | ..... | Valparaiso | 5.05 | 11.35 | 7.10 | ..... | 4.30 |
| p m | | | | | | | | | | |
| 1.05 | 6.30 | 12.00 | 10.05 | ..... | South Bend | 3.10 | 10.15 | 5.44 | ..... | 3.07 |
| 1.46 | 7.12 | 12.45 | 12.40 | ..... | Cassopolis | 2.15 | 9.40 | 5.13 | ..... | 2.25 |
| 2.33 | ..... | †1.33 | 3.42 | ..... | Schoolcraft | 1.20 | ..... | ..... | ..... | ..... |
| 2.44 | 7.55 | 1.48 | 4.30 | a m | Vicksburg | 1.10 | 8.52 | ..... | p m | 1.30 |
| 3.30 | 8.36 | 2.40 | 6.20 | 7.00 | Battle Creek | 12.15 | 8.15 | 3.55 | 9.35 | 12.50 |
| 4.33 | 9.26 | 3.25 | ..... | 7.47 | Charlotte | 11.14 | 7.23 | 3.07 | 8.40 | 11.55 |
| 5.10 | 9.55 | 4.00 | ..... | 8.20 | Lansing | 10.40 | 6.55 | 2.40 | 8.00 | 11.25 |
| 6.30 | 10.45 | 5.08 | ..... | 9.30 | Durand | 9.35 | 6.05 | 1.55 | 6.50 | 10.25 |
| 7.30 | 11.17 | 5.40 | ..... | 10.05 | Flint | 8.35 | 5.35 | 1.28 | 5.47 | 9.30 |
| 8.15 | 11.50 | 6.15 | ..... | 10.43 | Lapeer | 7.49 | 5.02 | 1.00 | 5.10 | 9.05 |
| 8.42 | a m | 6.35 | ..... | 11.05 | Imlay City | 7.28 | ..... | ..... | 4.48 | ..... |
| 9.50 | 1.00 | 7.30 | ..... | 12.05 | Tunnel | 6.50 | 3.50 | 11.55 | 3.50 | 7.35 |
| | p m | | | | | a m | a m | a m | p m | p m |
| 9.25 | ..... | ..... | ..... | ..... | Detroit | ..... | ..... | 10.40 | 4.05 | 8.00 |
| | a m | p m | | | | | p m | | | p m |
| ..... | 8.15 | 5.25 | ..... | ..... | Toronto | ..... | 9.20 | ..... | ..... | 1.00 |
| | p m | a m | | | | | a m | | | |
| ..... | 8.15 | 7.25 | ..... | ..... | Montreal | ..... | 9.15 | ..... | ..... | ..... |
| | a m | p m | | | | | a m | | | |
| ..... | 8.12 | 7.15 | ..... | ..... | Boston | ..... | 8.30 | ..... | ..... | ..... |
| | a m | p m | | | | | p m | a m | | p m |
| ..... | 7.50 | 4.25 | ..... | ..... | Susp'n Bridge | ..... | 10.15 | 7.05 | ..... | 2.05 |
| | a m | p m | | | | | | | | p m |
| ..... | 7.00 | 5.40 | ..... | ..... | Buffalo | ..... | ..... | ..... | ..... | 1.00 |
| | p m | a m | | | | | a m | p m | | p m |
| ..... | 8.53 | 8.08 | ..... | ..... | New York | ..... | 8.15 | 6.10 | ..... | 9.00 |
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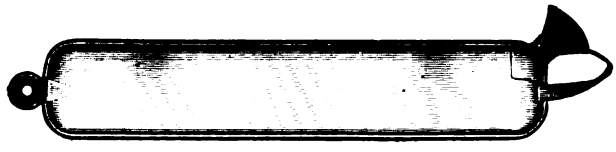

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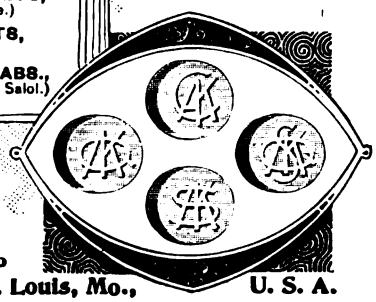

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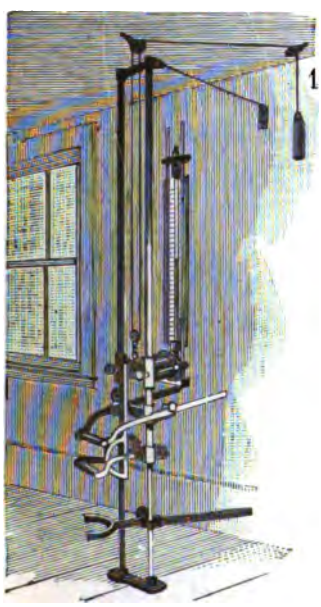

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## BACTERIOLOGICAL REVIEW.

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## ORIGINAL ARTICLES.

### A CASE OF CHRONIC DISEASE RELIEVED BY ACUTE FEVER.

BY A. J. SANDERSON, M. D.,
Sanitarium, St. Helena, Cal.

CONSIDERABLE has been written of late concerning the therapeutic value of fever in certain chronic diseases. The following case is suggestive, in that it illustrates what modifications of a chronic disease may be brought about by the vital activities set up in the process of acute fever. It is also of interest because of the relation that exists between the weight of the patient and the condition of the disease.

The patient came to the Sanitarium here the last of September, 1894, and at that time gave the following history: Male, aged sixty-five, native of the United States, lived during the development of his trouble in a coast city, at sea-level; occupation, minister; family history, negative. Patient had never used tobacco or alcoholic drinks; had lived well; habits sedentary. He had enjoyed good health and strength previous to twenty years ago, at which time he had an attack of what was called malarial fever, lasting several months, and leaving his system considerably prostrated. Eight years later he had a similar run of the same fever, accompanied by periostitis or ostitis of the right leg and lower left thigh. In places, bone abscesses formed, which left fistulous tracts, some of which are still discharging. Fresh extensions of the periostal trouble have since occurred at different times, but the patient has enjoyed comparatively good health until within the past few months, and has been able to attend to the duties of a large parish. He has not suffered in any way that called his attention to a disturbance of digestion, though he has grown nervous and depressed by his work, and especially during the last few months has been quite weak, being able to walk but a few blocks, and troubled with shortness of breath on exertion. At times the conducting of a public service would leave him completely prostrated. During the last three weeks he has twice been taken with sudden and severe paroxysms of pain in the left side, especially the arm. Once he was taken while walking on the street, and his suffering was so great that he had to be assisted home. He was relieved only by the use of morphin. He was examined by his home physician, who pronounced the trouble cardiac enlargement, with sclerosis of the vessels. An unfavorable prognosis was given, and the patient was sent inland to the Sanitarium at St. Helena, where the elevation is seven hundred and fifty feet, and the atmosphere warm and dry.

Examination was made October 3. The patient was a man of medium height; weight one hundred and eighty-five pounds, which is the maximum of usual weight; somewhat corpulent, but not very well nourished; muscles flabby; strength very deficient; skin sallow, slightly jaundiced; examination of lungs negative; area of cardiac dulness slightly increased; heart tones very weak, and not very clear, but no distinct murmurs were heard. The arteries felt hard and inelastic beneath the finger; abdominal wall was very thick but flabby; no abnormality was detected in the organs beneath. There were two discharging sores upon the leg, one about the middle of the anterior surface of the tibia, connected with the bone marrow. The skin on the legs showed serious congestion, and was poorly nourished. Examination of the urine showed the quantity to be 1100

c.c.; specific gravity, 1013; reaction, acid; color, high, clear, no albumin or sugar. The diagnosis was enlargement and fatty heart, with sclerosis of vessels.

The patient was placed on general tonic treatment, such as cold baths, massage, etc., with a nutritious diet, and appropriate exercise. From the time of his coming until June, 1895, the patient's general health improved. The diseased condition remained about the same, however, with occasional spells when the shortness of breath, cyanosis, weakness, and nervous symptoms were exaggerated. Sleep was very much disturbed, and the patient often had to get out of bed and walk the floor at night.

In June, edema began to develop in the feet, which gradually grew worse until both limbs were tense with fluid, and some ascites existed. Nothing seemed to better his condition, and hope of his recovery was abandoned. The enlargement of the heart had grown more serious.

This condition continued until the last of September, when the patient was taken suddenly ill, coming down with symptoms like ague. He had a decided chill, which passed off in a short time, and was not repeated. A continued fever came on, which lasted ten days. The first three days the temperature ran from 103° to 104° F., with a slight morning remission, then gradually fell until it reached the normal point. The acute trouble was general and catarrhal in nature. There existed marked pharyngitis, bronchitis, with catarrhal inflammation of the stomach, bowels, and kidneys. The urine showed about twenty per cent. of albumin by bulk, with a few hyalin casts.

A dermatitis set in on the ankle about the point of the old ulceration, and continued until it reached the body. As this subsided, a similar course of inflammation of the skin came on the other leg. During the first few days of the fever the edema markedly increased; ascites was excessive; some fluid could be detected in the cardiac and pleural cavities, while the gluteal and lumbar regions were highly edematous. Rales covered the back part of the lungs, especially the right. The shortness of breath and cyanosis became more marked; the patient was very weak, being unable to turn himself from the dorsal position. He was put upon a liquid diet, and fed every two hours. Heat was applied to the back of the chest and to the limbs, alcohol rubs were given frequently, and rubbing to the edematous muscles was kept up as much as could be borne. Antiseptic gargles were used. The bowels moved quite freely without mechanical assistance. Small doses of digitalis were administered.

After the fourth or fifth day the patient began to improve. The edema gradually diminished until it disappeared. After three weeks the patient began to walk, and his strength was rapidly regained. The albumin and casts entirely disappeared from the urine. During the fever the patient lost over thirty pounds in weight, coming down to one hundred and fifty pounds. Flesh was rapidly regained until the last of November, when he weighed one hundred and sixty-five pounds, and felt better than he had for years, and contemplated going back to his work. He then continued to gain in weight until he reached one hundred and seventy-four pounds, at which time there was a slight development of the old symptoms of impeded circulation. He was then placed on an antifat diet, excluding fats and sugars, with a minimum of starchy foods, and careful exercise of hill-climbing was prescribed. In two weeks he lost about four pounds of flesh, and the unfavorable symptoms again passed away. During the next four weeks the weather was so stormy that the exercise could not be continued, and the weight was again increased, with the corresponding shortness of breath and weakness.

There is now no edema of the ankles, though the flesh on the limbs, especially the calves of the legs, is very tense, more so some days than others, which indicates that the loss and gain in weight was due to some extent to water in the tissues as well as to fat. The area of cardiac dulness has been gradually extending to the left.

## AN INTERESTING CASE OF HYPOPEPSIA.

J. H. KELLOGG, M. D.

A MAN of twenty-five years, who had for a number of years been very closely confined at sedentary employment, working very hard, eating hastily, and indul-

ging in the ordinary abuses and dissipations in diet to which the majority of persons in this country are addicted, was received at the Battle Creek (Mich.) Sanitarium as a patient in December, 1894. Examination showed decided dilatation of the stomach, the lower border falling an inch below the umbilicus. The outline of the stomach could be very easily determined by the succussion wave produced in the examination of the stomach by the method described by the writer in a paper read before the American Medical Association at its recent meeting in Baltimore.

The first examination of stomach fluid gave the results shown in the accompanying table, column 1.

| | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Total acidity (A), | grams | .000 | .040 | .004 | .006 | .022 |
| Calculated acidity (A'), | " | .144 | .017 | .084 | .014 | .034 |
| Free HCl (H), | " | .000 | .000 | .000 | .000 | .000 |
| Combined chlorin (C), | " | .168 | .020 | .084 | .014 | .034 |
| Coefficient of albumin digestion(a) | " | .00 | 2.36 | .05 | .43 | .65 |
| Coefficient of fermentation (x), | " | .0 | .0 | .0 | .0 | .0 |

January 15, analysis gave the figures shown in column 2.

March 4, analysis gave the figures shown in column 3.

April 17, the results obtained by analysis were those represented in column 4.

May 5, the last analysis made, the figures shown in column 5 were obtained.

Several points of great interest are shown by these analyses, to a few of which attention is especially invited as having an important bearing upon the therapeutics of the case: —

1. The total absence of acidity in the stomach fluid at the first examination indicated a condition of apepsia. The tests for the products of the digestion of proteids showed the entire absence of peptone, syntonin, and albuminoids, although some propeptone was present. The coefficient of digestive work was, at this time, zero; in other words, the patient's stomach was doing absolutely no digestive work of any value. This will very readily explain the fact that the patient was anemic, weak, and neurasthenic, or suffering, as his physician said, from nervous exhaustion. We have found this state of things existing in a considerable proportion of cases of so-called nervous exhaustion.

An examination, made a few months later showed that the stomach was beginning to resume its normal functions. The amount of combined chlorin had not increased, but the value of the digestive work done had improved to such a degree as to produce a coefficient of .05 instead of zero.

Six weeks later the coefficient had risen to .43, and May 5, about five months after the beginning of treatment, the coefficient had risen to .65, the total acidity being .022, instead of zero, as at the beginning. The amount of work done by the stomach was still far below normal, but the quality had improved immensely, and could be safely trusted as an index to a general vital improvement. The patient was somewhat discouraged, declaring that he had not gained a pound in weight; but when his strength was tested by the dynamometer, it was found that he had gained 600 pounds in strength, although his weight had remained the same. This improvement in quality, in other words, in the sum total of neuromuscular energy of the body, is a far better index to the patient's vital condition than a mere gain in weight.

The class of cases represented by this patient is an exceedingly interesting and not a very uncommon one. In quite a number of the cases of this kind which have come under the care of the writer, it has not been possible to effect a radical cure; that is, to bring the work of the stomach up to the normal standard; and it is probable, as suggested by Ewald, that in these cases the intestine manages to do the digestive work required by the body, the stomach being quietly retired from usefulness. But a point of far greater importance is gained. It is possible for the body to dispense with the stomach as a digestive organ, as shown by the experiments of Drs. Pachon and Carvallo upon cats, in which these animals were found to enjoy perfect health, notwithstanding the total removal of their stomachs, the intestine being joined to the esophagus.

Careful observation in a large number of these cases has convinced the writer that the principal damage suffered by the body in cases of dilatation and atony of the stomach does not arise from the failure of the stomach to do its ordinary work in dissolving or digesting the food elements, but from the long retention of food substances within the stomach, and

the development of poisonous substances therefrom, as the result of the action of microbes upon the food elements. It is quite possible, in fact, that there may be added to these poisonous substances another arising from a perversion of the normal chemical processes whereby the albuminous elements of the food are converted into peptone, resulting in the production of albuminoid or chloro-organic compounds of a toxic character, and incapable of serving any useful purpose to the body. I have found an abnormal quantity of these chloro-organic compounds, as indicated by the low coefficient of peptic digestion, present in a very considerable number of cases subject to attacks of nervous headache and other nervous symptoms, the cause of which I think has been clearly shown to be due to autointoxication.

By means of lavage, the employment of intestinal antisepsis, and an aseptic diet, pains being taken so to prepare the patient's food as to give the stomach as little disintegrating work as possible, I have been able to suppress the development of these poisonous substances, and thereby to secure relief from the symptoms growing out of the absorption of toxic matters from the stomach.

The great improvement secured for the patient previously mentioned, was doubtless due to gain in this line. The measures of treatment employed were tonic baths, manual and mechanical Swedish movements, massage of the abdomen and the stomach employed in such a way as to aid the stomach in emptying itself of its contents, and an antiseptic regimen, including kumyzoon (an improved kumyss prepared from sterilized milk without the addition of yeast or cane-sugar), antiseptic charcoal tablets, and systematic lavage. The result of the lavage was to remove the mucus from the stomach, which, on first examination, was found present in considerable quantities.

## A LAY SERMON ABOUT PREACHERS AND TOBACCO.

[We are glad to republish the following excellent article by R. B. Gilbert, M. D., demonstrator of anatomy, and clinical professor of the diseases of children, at the University of Louisville.— Ed.]

The Louisville Conference of the Methodist Episcopal Church, South, at their recent annual meeting, upon the recommendation of the committee on temperance, passed a resolution, by a small majority, condemning the use of tobacco among its members. While the resolution was under discussion, quite a number of the reverend gentlemen undertook to defend the use of tobacco, stating that "it is a great comfort," and that its use just before preaching a sermon helped them "to preach better by stimulating the nervous system and brightening the intellect." A certain presiding elder, who is himself a slave to the "seductive weed," made quite a lengthy speech in defense of the filthy and disgusting habit.

To a layman who has seen and experienced the evils of the tobacco habit, it seems strange indeed that ministers of the gospel, whose duty it is to combat all forms of evil and folly, and who stand as examples before the youth of the community, should use the evil stuff; and more marvelous still, that some of them should stand up in open conference and make labored, serious arguments defending the folly.

It would be a blessing to the youth of this country if every preacher would not only abandon the use of tobacco, but would preach and pray, in season and out of season, against it. Many a poor, weakly young man who has persisted in the use of tobacco to the ruin of his health, if not the degradation of his morals, when chided for his folly, replies, with an air of triumph, "Surely there can be no harm in tobacco, since the Reverends A, B, and C (all good men) use it."

Let us point out some of the evil effects of tobacco for the edification of our misguided reverend brethren, in the hope that they may be induced to abandon its use. If for no other reason, they should do this because it injures the health and vitiates the appetite, often begetting a desire for alcoholic stimulants. Thus it may be the forerunner of drunkenness. Only a few days ago a poor drunkard told me that so long as he abstained from tobacco he could keep sober, but if he smoked a few cigars, his cravings for whisky became irresistible. This young man's experience is that of many. Smoking and drinking go hand in hand to destroy the youth of our land.

The use of tobacco was adopted by the Spaniards from the American Indians shortly after the discovery of the new continent by Columbus. In the year 1560 it was introduced into France by the ambassador of that country at the court of Lisbon, whose name, Nicot, has been perpetuated in the generic title of the plant.

There are several poisonous principles extracted from tobacco, with such high-sounding names as nicotin, nicotianin, malic acid, ammonium, etc. But the chief of these poisons is the active principle known as nicotin, which experiments on the lower animals have proved to be one of the most deadly poisons known in the vegetable kingdom. Cigars when smoked give off gases, which when collected and examined are found to be oxygen, nitrogen, carbonic acid, and marsh gas, the smoke at the same time depositing empyreumatic by-products, which are deadly poisons.

Tobacco is a powerful sedative poison, which is locally irritant. Moderately taken, it calms mental and bodily inquietude, and produces a state of general languor and indifference which seems to have great charms for those habituated to the impression. Used in large quantities, it gives rise to confusion in the head, vertigo, stupor, faintness, nausea and vomiting, and general depression of the nervous and circulatory functions, which, if increased, eventuates in alarming and even fatal prostration. Many of the so-called cases of "nervous break-down" attributed to overwork are due to nothing but the excessive use of tobacco. Go into the counting-rooms of many of our merchants, and you will find a spittoon filled with tobacco juice, and the fumes of tobacco smoke filling the room; and yet if the merchant feels dizzy and languid at the end of a day's work, he complains of the anxieties of business telling upon his nerves!

If you have a noisy tom-cat that catches no mice, but makes night hideous with his squalls, and you wish to kill him, catch him, and draw a broom straw through the stem of your pipe, collecting some of the gummy substance which is there; now put one drop of this tobacco-smoke gum on the cat's tongue, and in a few minutes he will be laid out dead. I have known calves to be killed by rubbing on them a decoction of tobacco to destroy vermin.

I am not trying to scare the reverend tobacco habitués; I am stating every-day facts. If you don't believe me, just examine a work on vegetable chemistry, and try the cat experiment. But some one will say, "We don't take these poisons; we spit them out and smoke them out." I apprehend that such ignorance of the real nature of the poison as such remarks show, is the reason so many use tobacco. Surely the millions who use tobacco would not continue the habit if they knew what a deadly poison it is. You may ask, "If it is such a deadly poison, why don't it kill us?" It will kill you by inches, or by fractions of an inch, if you please. Its use gradually undermines the health of the strongest man, and for years he may not realize it; but let an attack of severe illness overtake him, and he is unable to withstand the ravages of disease because his system is already saturated with a narcotic poison, and he must succumb to an attack that one who is not a tobacco-user might readily recover from.

Tobacco is such a virulent poison that doctors are afraid of it, and never prescribe it. When a person takes an overdose of opium, he may be relieved by evacuation of the stomach and by the use of stimulants internally and externally. For an overdose of arsenic there is the hydrate of iron, but for an overdose of tobacco there is no remedy; it sinks its victim lower and lower into death, in spite of all efforts to save him.

Here are some of the diseases attributed to the use of tobacco: Dyspepsia, water-brash, cancer of the mouth, impotency, laryngitis, angina pectoris, palpitation of the heart, amaurosis, color blindness, insanity, horrors, suicidal mania, etc.

If you have a friend whose sight is failing, before he goes to the eye and ear doctors for advice, get him to suspend tobacco for sixty days, and he will probably have no need for a specialist. If you find a tobacco-eater black with the "blues," and contemplating suicide, assure him that if he will abstain for sixty days, the shape and color of things will become better and brighter. If your tobacco-smoking friend has that scape-goat of all uncertain ailments, the "liver complaint," assure him that "thirty days" will relieve his biliary embarrassment, and sixty days will restore his health to par. If you find a poor, miserable being, with cancer of the lips

or tongue, brought on by smoking tobacco, you might as well tell him to smoke on, for he has a disease that baffles all human skill, and will torture him to death. There is no more horrible death than that resulting from cancer of the tongue, and the smoking of tobacco is set down by all authorities as one of the predisposing causes of this disease.

Talk of distilling the essence of Christianity through quids of tobacco! How can a preacher dare to stand up before the altar of God and attempt to dispense the sweet savor of gospel truth, with his tongue reeking in loathsome poison? I have no patience with a so-called "temperance man" who appeals to a "drinker" with his mouth full of tobacco. The drinker, if he is not a chewer, is the more temperate of the two.

Another count against the use of tobacco is that it is a very expensive habit. The average smoker will use, say four cigars daily, costing at least twenty cents. Now, at the end of ten years this cigar money, with interest, will amount to one thousand dollars! The money spent in the United States every year for tobacco would build a railroad to the Pacific. The money spent every year in the Christian world for tobacco would put a copy of the New Testament into the hands of every human being! Go to, then, philanthropist! Here is something to be done right at home, and all can work at it. Come out and show your fellow men what they are doing when they feed their bodies on nicotin.

## CHASTITY AND HEALTH.

[THE following letter, a simple statement of facts, enforces more emphatically than any argument could do, the danger of unchastity, and the awful consequences of impurity. We agree with the writer that syphilitics ought to be treated in the same manner as persons suffering from smallpox, scarlet fever, or any other contagious disease, and quarantined during the infectious stage of the disease at least.— EDITOR.]

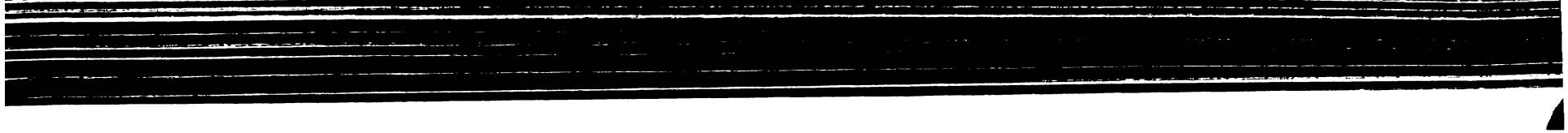
*Editor Modern Medicine.*

MY DEAR SIR: I read a few days ago, with great interest, your article in the October journal on "Chastity and Health." I am a strong advocate of the examination and quarantine of syphilitics, and believe there should be syphilitic hospitals conducted on the same principle as our smallpox hospitals— that of preventing the spread of contagious disease — where every man and woman who is found suffering from syphilis in the inoculation stage shall be sent and treated till that stage is passed. The expense to the State would be small compared with that of the institutions that are now supported for blind, crippled, and idiotic children who have been made so by this disease.

Weekly examinations would amount to but little unless the patients were quarantined. I will give as an illustration one case that came under my notice, which I think will convince any unprejudiced mind that examination and quarantine would protect innocent wives and children.

Miss May, a prostitute twenty-three years old, consulted me in August, 1891. She had a chancre of the urethra. I advised rest from her occupation, but was told on my next visit two days later, that she had entertained seven men during the previous night. Four weeks from this date a traveling salesman thirty-six years of age, married, consulted me. He said he had visited my patient, Miss May, about a month ago, and had contracted a disease. He was afraid he had inoculated his wife, and arranged to bring her to my office for examination. I found, on examination, two well-developed chancres of the right labia and a pregnant womb. Six months later she gave birth to a seemingly healthy child. Ten days later I was called to see the babe, and was told by the mother that it had scarlet fever. I found the temperature 104° F., and the body covered with an eruption. The usual syphilitic treatment seemed to improve the patient until the end of the third week, when I was again summoned because the child could not open its eyes. An oculist was called, and the child was treated for syphilitic conjunctivitis.

Until forty-eight hours previous to this visit the child's eyes seemed to be free from disease, and the mother thought it had taken cold while on a visit to her parents. I heard no more of the case for four years, until about a year ago, when the father consulted me again, but not professionally. He wanted me to refer him to some one who would put the child into a blind asylum to be cared for



until it could care for itself. He had lost his turbinated bones and his position on the road. His wife, who seemed well before the birth of her child, was now bedridden, after undergoing ovariotomy.

Now if Miss May had been quarantined when I visited her the first time, might not this wife and child have escaped this disease? If so, is not every man and woman who has a voice in governmental affairs morally responsible for their condition?

Another patient with primary syphilis refused even charitable treatment, and carried a book wherein she kept the number of men that she had inoculated. When I last saw her, she declared the number had reached two hundred and nineteen, and that she would not be treated until she had had revenge on five hundred men.

What can we as intelligent men and women mean by allowing such parasites to run at large? I have practised medicine fourteen years, and have been chairman of the police committee of the Illinois Woman's Alliance for the past two years. I have had untold experiences with this class of women. I believe that examination, and quarantine until the inoculation stage is passed, would protect innocent wives, and save thousands of children yet unborn from coming into the world with syphilis, the only legacy that many of them will ever inherit from their parents.

Very sincerely thine,

LUELLA DAY-UNDERHILL, M. D.
*420 W. Madison St. Chicago, Ill.*

## MOROCCO MIDWIFERY.

BY J. E. BUDGETT MEAKIN, M. D.

THOUGH I have known of cases in which a Moorish woman has gone forth in the morning to her reaping or her washing at the well-side, childless, and at night has returned with a new-born infant on her head or hip, things do not always work so smoothly, even in that country of unrestricted growth and development. In the towns especially, the midwife—there significantly styled the "receiver"—is a personage of no less importance than our old friend "Mrs. Gamp," and of much the same level of intelligence and information. Males are, from the nature of the social conditions of a strictly Mohammedan country, rigidly excluded from all share in attentions on womankind, and it has only been on occasions of rare confidence or enlightenment that even European medical men have been trusted in such matters. That this arises, however, from no delicacy of feeling is evident from the unrestricted way in which a Moorish woman will converse on all her troubles and experiences, with a man. Though the Moorish code of manners is so strict that a woman, a pig, and a Jew are never mentioned in polite society without an excuse, and are not considered fit subjects for conversation with strangers or superiors; when the Moor feels himself at home among his friends, there is no more favorite theme than the fair sex, and doubtful dealings therewith. It has been urged by apologists for Islam that it has at all events kept its women moral, but it has only done so in so far as it has succeeded in degrading them to the level of captive subjects for the lusts of men, as the native proverb has it, "slaves by day and queens at night." It would hardly be going too far to say that no woman in Morocco is chaste who has it in her power to be otherwise, and that no man loses the slightest chance of gratifying his exaggerated lust, indulging in unnatural vice when that which is natural has, through abuse, lost its fascination. It may seem that these remarks hardly depend on the subject in hand, but they will be of no less interest, as from their nature they cannot be touched upon in more popular connections.

Marriage is entered into without any previous acquaintance, or the exercise of selection on the part of the parties immediately concerned, whose first introduction takes place the night after the marriage. The bridegroom's house or hut having been cleared of all but the newly arrived bride and an old negress, who is the mistress of ceremonies, the groom, of perhaps eighteen, is ushered into the room of his wife, aged twelve. After a reasonable time he hands out the lady's drawers for the inspection of the negress, who testifies by shrill cries of joy which are at once taken up by the crowd outside, and supplemented by the firing of guns, that the girl has been found a virgin. If this is not the case, it depends upon the fear or otherwise in which the bridegroom

holds her parents, or the feelings with which she has inspired him, whether he at once repudiates the marriage by informing his friends that they need not wait to congratulate him, and by sending the girl home next day, or tells the slave to give the signal whether or no, and sends her back quietly later on, or even keeps her. When widows or divorced women are remarried, no fuss is made.

When married, the Moor shows himself ahead of most Westerners, for he will on no account sleep with his wife, only visiting her during the night, usually toward dawn, immediately after which he goes to purify himself for morning prayers by a steam bath. After the wedding the man has to remain indoors for a week, the woman for a year. At the end of six months the monotony of her existence is relieved by the preparation for her first-born. Flour, semolina, butter, honey, and spices are got together for the prospective feast; and as the time approaches, fowls, eggs, and a sheep or ram are procured, and quantities of biscuits are made by the happy expectant.

When at last her pains come on, the midwife and her women friends are sent for. Small boys and girls playing about the room are not supposed to be in the way during the every-day performance which ensues. The patient is seated on a stool or hassock in the center, holding herself rigid, and at times nearly erect by clutching at a sash suspended from the roof. Two women hold her shoulders from behind, and the midwife holds her round the waist in front, telling her to testify and pray to Mohammed, which she does with all her might, amid her yells. If hard to deliver, the patient is sometimes dosed with charm-papers torn up in water, or a sheet which has been used by the woman is sent out into the street borne by four schoolboys, her bracelets lying in the middle. As the lads visit the various mosques and saint-houses of the locality, calling on God to help her the while, passers-by throw in trifling contributions, which go to the schoolmaster, while the boys are rewarded by a half-holiday. After delivery, the mother is dosed with honey and aromatic herbs.

If the child proves to be a boy, great are the rejoicings; if a girl, the event is taken philosophically. The cord is tied with string. and cut with a knife. The nose is carefully shaped, and the uvula is cut, that it may soon speak well. The placenta, blood, etc., are carefully buried. Children born in cauls are said to have "come wrapped up by God." The new arrival is first smeared with paste of Egyptian privet with which also its palate is painted, and for the first seven days the child is left unwashed and wrapped in old clothes. During that time all visitors (women only) are supplied with semolina bread and honey, or if the parents are well-to-do, with tea and cakes. Country griddle-cakes and eggs are distributed. If it is a boy, a "powder-play" is arranged outside, the players being fed and provided with powder for their long flint locks.

On the eighth day, called the seventh after the birthday, occurs the ceremony of naming. At 10 A. M. the father cuts the throat of a sheep, saying, "In the name of the great God, for the naming of so-and-so, son of so-and-so," having first asked the mother the name. That evening the company feasts on the sheep, and the mother and child are purified with the prescribed religious washings, the latter being thenceforth dressed in new clothes. For the assistance she has rendered, the midwife receives the fleece and a fore-leg of the sheep, with perhaps a present in cash and eatables besides. She comes each day for the next week to assist the mother to wash and dress the child. If it is a girl, the sex is sometimes kept a secret from the father till the naming day.

Sexual connection is not permitted to the parents till forty days after delivery, and then only after a fresh purification. Boys are suckled for two years and two months, and girls for four months longer, but it is said to increase a boy's capabilities at school if not over two years at the breast. When the mother has no milk for her child, wet-nurses are not difficult to procure; but I knew one case in which the grandmother was stated to have supplied the defect as a result of treatment, my note of which I have mislaid, but as nearly as I can remember, it was the application of burnt rabbit's liver to her breasts.

The Mosaic regulations with regard to intercourse during the menses were adopted by Mohammed, and are consequently in force, as are also those regulations which determine prohibited degrees of relationship for marriage.

As a curious instance of the skill of some of the native midwives, may be mentioned the experience of Dr. Castex, a military medical attaché at Tangier in 1858. His efforts having failed to replace an inverted matrix, a native was called in, who hung the patient up by her heels till it went back. The woman died, it is true, but the doctor did not attribute her death to this mode of treatment.

But perhaps the most curious customs in this connection arise from the belief that the period of gestation may be indefinitely prolonged. A Moor goes away for the pilgrimage to Mecca, and when he returns a year later, finds his wife still pregnant, awaiting his presence for the festivities attendant upon an addition to their family. Cases have been known in which the husband was quite satisfied with this state of things,— or at least expressed himself so to the outside world, —after an absence of several years. Still more extraordinary was a case which came under my own observation, in which extensive property was left for a certain purpose, provision being made for the widow to remain in the enjoyment of it if with child at her husband's death, till it should be seen whether a son or a daughter or neither would have to be provided for. For the first few months the widow's word that she was in such a condition remained unquestioned, and later, when her assertions began to be questioned by the baffled heirs, it was sufficient for her to produce midwives who swore to the fact that an arrival might be expected any day, to secure her in undisturbed possession, which she had already enjoyed for some years when I heard last of the case.

Circumcision is performed in the towns at the age of four or five, and in the country as late as twelve or thirteen. The operation takes place in some mosque or saint's shrine, at the hands of a barber. Being performed with a pair of scissors while the prepuce is held in the hand, it is always held possible to detect a Jew, from the difference of the resulting cut from that made with a knife on skin held in a special vise. The moment the skin has been cut off, one of the assistants throws over the wound some astringent powder, said to be the dried dung of rabbits; and for ointment the fat and oil in which sun-dried meat is preserved is employed.

Castration is often performed when lads are quite young, but from the difficulty of inducing the victims to give information, I can only mention two methods, on native second-hand authority. The one is to cut off the whole of the genitals at once with a gold coin beaten to an edge, and then to cauterize the wound with another gold coin. The other is to tie the feet of the boy together under a bull which has been kept without water for days, so seating him on its back that the testicles are pressed underneath him. The thirsty animal is then set free to seek water at a well-known spot some distance off, the effect of its rapid and uneasy gallop being to castrate the unfortunate rider. Eunuchs only are employed in the royal harem, where they are very fat and pompous, usually named most fancifully. It has not been unknown for such to attain considerable influence.

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**Race and Longevity.**— Dr. Billings says that the colored race are shorter lived than the whites, but less liable to malaria, yellow fever, and cancer, and more liable to tuberculosis and pneumonia. The children of the Irish race are usually healthy, but the adults suffer from tuberculosis, pneumonia, and alcoholism. The Germans are especially afflicted with dyspepsia and cancer, according to Dr. Billings [we think he ought to have added Bright's disease], as the result of beer-drinking and smoking. The Jews have the lowest death-rate, and a greater longevity. They suffer less from consumption, pneumonia, and alcoholism than do the other races, but are said to be more liable to diabetes and diseases of the nervous system.

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**New Method of Purifying Water.** — Dr. Bordas, a pupil of Dr. Brouardel, of Paris, has recently discovered a method of purifying water by means of permanganate of lime and binoxid of manganese, by means of which water containing three million germs per ounce can be quickly and perfectly purified. The method has not yet been adapted to public use.

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CONSUMPTION kills more persons annually than any other disease. In this country, diphtheria comes next in fatality.

# TRANSLATIONS AND ABSTRACTS

[THE articles in this department are prepared expressly for this journal.]

## HYDROTHERAPY IN FEVERS.

THE treatment of fevers by the cool bath is as old as the teachings of Hippocrates. Hydrotherapy properly used in fevers is not hydropathy. The classical demonstrations of Winternitz, Voit, and Schüller in Europe, and of Baruch, Draper, and Thayer in America, have clearly defined the basis of its physiological action, and placed it in the front rank of rational therapeutics. The cardinal principles of the physiological action of the cold bath in fevers depend: —

1. On the physical properties, thermic and mechanical, of water itself, acting directly as a neural stimulant.

2. On the susceptibility of the sympathetic nervous system to these stimulants, and its control over the vascular and glandular organs of the body.

This stimulative action takes place primarily on the cutaneous surface. The skin is a threefold organ, at once the richest in sensory nerves, the greatest in vascular expansion, and the largest in glandular supply of all the organs of the body.

Stimulation of the respiratory centers is the first and immediate reflex action from the application of cold water to the cutaneous surfaces. Deep spasmodic inhalations take place, and improved oxygenation of the blood is at once manifest.

Circulation is quickened by reaction on the cutaneous vascular system, which is heightened by friction. The effect on the circulating medium itself is still more wonderful. Winternitz has demonstrated that all applications of cold to the entire body lead to three remarkable results; viz., an increase in the number of white blood corpuscles, in the percentage of hemoglobin, and in the specific gravity of the blood.

Juergensen proved that the specific gravity of the urine was increased after the cold bath, through the increase of urea and other toxic products washed from the tissues by the improved blood supply.

In typhoid fever, according to Roque and Weil, the toxicity of the urine was increased sixfold after the Brandt baths.

No known drug remedy can so quickly and definitely influence the functional activities of living cells in nerve, gland, or muscle, or protoplasm itself, as water, when appropriately used in fevers.

My own practise is not to wait for a diagnosis, but to institute some appropriate bath for all fever patients at once. Nothing but good can come of it, no matter what the diagnosis, and in the event of typhoid everything is to be gained.— *By Albert H. Burr, Ph. B., M. D.*

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**Toxic Effects of Diuretin.**— Huchard, in a paper presented before the French Society of Therapeutics, Jan. 8, 1896, called attention to the fact that diuretin is a toxic, rather than a therapeutic, substance. We quote from the report of his paper in *La Presse Medicale*, the following, relating to diuretin: "This is a mixture of soda, four per cent., theobromin, eighteen per cent., salicylate of soda, sixteen per cent. This is a very bad mixture and very toxic, as was shown by the experiments of Gley upon a dog. It has produced palpitation of the heart, cyanosis, and arhythmia, symptoms which cannot be attributed to pure theobromin."

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**New Method in Abdominal Massage.**— The following new mode of abdominal massage is described by Kümmerling (*Wien. Med. Woch.*, Nov. 30, 1895), and is offered as an improvement upon the method previously employed. It consists in manipulation of the colon chiefly by pressure with the thumbs while the patient is lying in the right or left lateral position. The descending colon is first manipulated while he is lying upon the right side, the manipulations being from above downward. The patient then lies upon the left side, and similar movements are made along the ascending colon from below upward. These movements are followed by manipulation of the transverse colon and the small intestine. The patient then assumes the knee-elbow position, when the parts are kneaded by the fingertips or the closed fist.

[I have for a long time employed a method somewhat similar to this, consisting in placing the patient in the knee-chest position, and then making manipulation while standing by the side of the patient with the back to the patient's head, reaching one arm around the patient's body. The patient may assist greatly in this method of massage by taking deep inspirations, at the same time, thus lifting the abdominal contents, and by drawing in the abdominal muscles well at the same time that the chest is forcibly expanded as in inspiration, but without admitting air to the lungs.—J. H. K.]

**Leprosy Treated with Serum.**— In a late communication, Dr. Carrasquilla, of Colombia, gives an account of four cases of well-marked tubercular leprosy, characterized by leontiasis and the anesthetic phenomena commonly seen in this disease, which were treated by injections of an antileprosy serum. Prompt improvement followed the use of the serum, and recovery, save for the persistent marks of the ulcerative features of the disease, ensued, in every instance, in less than a month.

Among other records of the serum treatment, it is claimed that—

1. Anesthesia is overcome, more or less rapidly in proportion to the extent and gravity of the lesions of the peripheral nerves.
2. Edema disappears, the skin becoming wrinkled, and finally returning to its normal state.
3. After abundant suppuration, the ulcers heal very rapidly, leaving the skin perfectly sound.
4. The appetite and desire for sleep returns.
5. With the disappearance of edema and tubercles, the countenance grows thinner, losing its leontine aspect entirely.

**Sulphocyanic Acid in the Gastric Juice.**— Nencki (*Journal de Pharmacie*), who has previously announced the presence of sulphocyanic acid in pure gastric juice containing no saliva, has made new experiments with large quantities of such juice. Two hundred cubic centimeters of this juice, previously neutralized with soda. are evaporated to dryness. The residue is acidulated with hydrochloric acid and exhausted with ether, which removes almost all the sulphocyanic acid. The ether is dispelled by evaporation, and the residue is neutralized with ammonia-water. Thus is obtained a liquid which yields, with perchlorid of iron, an intense red coloration, which disappears on the addition of tartaric acid, to reappear when hydrochloric acid is added. Sulphate of copper colors this liquid green, while cupric sulphite produces in it a white amorphous precipitate of sulphocyanide of copper.

Fresh gastric juice contains about 0.005 of a gram of sulphocyanic acid per liter. Nencki has sought for this acid in the muscles and liver of the dog, but always with negative results.

**Etiology of Malignant Tumors.**— Roncali, Corselli, and Grisco consider that malignant tumors are caused by blastomycetes. In a case of adenosarcoma of the ovary, Roncali found blastomycetes in large numbers. In each of five sarcomata, taken from the different regions of the body, he found that parasitic forms were present in small or large numbers. They stained in the characteristic manner, withstood acids and alkalies, were found inside and outside of cells, multiplied by germination, and were divisible, by their general appearance and staining reactions, into young and old forms.

Corselli and Grisco describe a human case in which blastomycetes were the cause of a malignant tumor. These investigators obtained during life and after death, from a case of sarcoma of the mesenteric gland, the organism in pure culture, and succeeded in producing similar growths in animals by inoculation.

**Puncture of the Pericardium.**— M. de Lorme, of the Academy of Medicine, Paris, by careful dissection of dead bodies, has shown that the best means of puncturing the pericardium is to introduce a needle close to the edge of the sternum, on a level with the third and fifth intercostal spaces. After reaching the posterior surface of the sternum, the needle is turned inward, and passed into the posterior surface for two fifths of an inch. By a resection of the third, fourth, and fifth cartilages, it is possible to bring the pericardium into view, where it is recognized by its pearly whiteness.

**Empyema in Children.** — Dr. E. Cantley, of London, quotes from the *Lancet*, 1894, an excellent study of a large number of cases of empyema in children, from which he draws the following conclusions: —

1. Pus found in the pleural cavity should be removed.
2. The best method is simple incision and drainage, without resection of a rib.
3. The best point for incision is the fifth space in the mid-axillary line.
4. Irrigate only in cases of fetid effusion.
5. Exploration and scraping of the cavity are not required.
6. Resection of a rib is not required in children.
7. Resection of a rib may sometimes be necessary to secure closure of the sinus.
8. Collapse of the chest wall is not a result to be desired in the early stages of treatment.
9. Rapid and complete expansion of the lung is the great object of treatment. The tube must be removed early.
10. In cases of double effusion, aspirate on both sides. The next day, operate on the left side; a week later, operate on the right side, using local anesthesia.

**Vitality of Diphtheria Germs in Water.** — Experiments to determine whether the Löffler bacillus retains its virulence in water have been made by Demetria (*Revista de Ciencias Modernas*), with the following results: He found that it rapidly loses its primitive virulence in distilled water as well as in sterilized, and also in running water, but that it promptly regains it when transplanted to favorable soil. Fresh, running water seems most destructive to the bacilli, as they disappear in it in seven to nine days.

**Typhoid Fever in Relation to Drinking-Water.** — The introduction of Pasteur filters at the French stations has enormously diminished the typhoid mortality in the French army (*British Medical Journal*, Jan. 11, 1896), in most instances practically removing it. A further striking proof of what pure water will do in the abolition of typhoid is furnished by the mortality returns for the Parisian suburb of St. Owen. In 1892 the water supplied to this district was of a decidedly questionable quality, and during the twelve months there were recorded twenty-four deaths from typhoid fever, this, it is stated, being about the average for the previous ten years. After filtering was introduced, deaths from typhoid fell to six in 1893, two in 1894, and during the year just ended, only one death from the disease was recorded.

**Gonococci in the Pleural Cavity.** — In a review of all the reported cases of this nature by Faitont, he finds one case which seems to definitely prove that gonorrheal pleurisy may occur. The case was that of a young girl, aged eleven years, who was assaulted by an individual with gonorrhea. Some days afterward she was attacked with severe polyarthritis, and later a double pleurisy developed. She also showed symptoms of endocarditis and pericarditis. Dr. Mozza, on examination of cover-slips containing the pleural exudate, found numerous organisms morphologically resembling gonococci within the leucocytes. He was able to cultivate the organisms, and found that he was dealing with a pure culture of Neisser's coccus.

**Protection against Cholera.** — After more than two years of hard work in India, Professor Haffkine has returned to England to demonstrate, by a record of seventy thousand injections, the value of this preventive measure against cholera. When this disease was raging the most fiercely, and the entire population seemed exposed to it, the result of inoculation was most favorable. It is now generally conceded that Professor Haffkine has discovered a protection against cholera.

**Perception of Vibratory Sensation by the Skin.** — Dr. Treitel (*Medical Week*) has discovered that the skin of various parts of the body is capable of appreciating the vibratory impressions produced by a tuning-fork. The direction of these vibrations varies in different persons and diseases, also in different parts of the body. It is hoped that this new fact may prove of service in the diagnosis of certain forms of nervous disease.

**Chronic Coffee Intoxication.**—In a recent paper read before the Société des Hôpitaux. Gilles de Tourette (*Gazette Medicale de Paris*, July 20, 1895), calls attention to the fact that chronic coffee poisoning is much more common than is generally supposed, and is usually confounded with alcoholic disturbances. The poison acts principally on the stomach and the nervous system.

Coffee dyspepsia very closely resembles alcoholic dyspepsia; the symptoms are morning expectoration of mucus, pain in the epigastric region, and marked anorexia. The disgust for food finally becomes so great that the patient can only take coffee, or bread soaked in coffee, and in this manner the poisoning rapidly increases in severity; nausea and vomiting, with acid pyrosis next appear, and the patient becomes much emaciated. On the side of the circulation a slowing of the pulse is usually observed, palpitation being rare.

The nervous symptoms are marked. Insomnia is common; or if sleep occurs, it is often accompanied by terrifying dreams. General tremor is often present, with fibrillary twitching of the lips and tongue. Cramps in the limbs may occur. The general sensibility is diminished in a certain number of cases. Paralyses have not been observed. In children, arrest of development takes place.

The stoppage of the coffee generally results in a rapid cure, much more rapid than from similar troubles due to alcohol. —*American Journal of the Medical Sciences.*

**Bicycle Riding and Heart Disease.** — Dr. Herschell, of London, has called attention to the danger of overdevelopment in cyclists. The bicycle rider is apt to take more exercise than he is aware of. Degeneration of the heart may result from hypertrophy, or overdevelopment from excessive strain,— the result of hill-climbing or other violent effort. Acute dilatation of the heart is indicated by shortness of breath. Chronic valvular disease of the heart may sometimes result from this cause. The preventive measures suggested are a low gear, the upright position in riding, proper food, and especially the avoidance of such muscle poisons as beef tea and preparations of kola and cocoa, which destroy the sense of weariness, but do not diminish the consequences of effort. The bicycle rider should slow down to an easy pace at once when he finds himself short of breath, or when he experiences a sensation of weariness or constriction in the chest.

**Syphilis after Twenty Years.**— MM. Marie and Bernard, two eminent French physicians, report two cases of locomotor ataxia in which the first symptoms appeared over twenty years after syphilis had been contracted. In one case, the first symptoms of locomotor ataxia were noted twenty-one years after exposure; in the other, a year later. Within two or three years afterward, both were suffering the most pronounced symptoms of locomotor ataxia, including inco-ordination. In view of such facts as these, how is it possible for physicians to speak so frequently and with great assurance respecting the absolute curability of this awful malady, whereby nature punishes the vice of impurity?

**Pregnancy after Ventral Fixation.** —Miländer (*Zeitschrift f. Geb. u. Gyn.*, January, 1896) has studied seventy-four cases of pregnancy after ventral fixation. Presentation was normal in forty-nine cases, cross-birth occurred in three cases, foot presentation in one case, and in one case the ear was presented. Artificial aid was required in eleven cases. The cross-births were doubtless due to an enlargement of the uterus transversely instead of longitudinally. The unusual number of cases requiring artificial aid was doubtless due to the ventral fixation.

**Scurvy from Sterilized Milk.**— Dr. Lewis Starr claims to have seen several cases of scurvy in children resulting exclusively from the use of sterilized milk, which were cured by the employment of unsterilized milk, with the addition of raw beef juice. We are not sure that the same results might not have been attained by the addition of orange juice, strawberries, baked apples, or some other form of fruit to the diet of unsterilized milk; and meat juice is certainly not necessary. The children were aged from fourteen to twenty-two months. Adults need a greater variety of food.

# BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE AND BACTERIOLOGICAL REVIEW, from original sources.]

**Summary of Serum Therapy.**— The following is a summary of an interesting discussion by Schaefer (*Arch. Gen. de Med.*) of the present state of serum therapy as regards practical results:—

"1. *Tuberculosis.*— Treated with serum obtained from refractory animals by Richet and Héricourt without definite results up to present time.

"2. *Rabies.*— Immunization by vaccination gives better results than serum treatment.

"3. *Pneumonia.*— Serum from immunized rabbits is difficult to obtain, consequently this treatment has not been used to any great extent. The subject is promising enough to deserve further investigation.

"4. *Enteric Fever.* — Good results have not been obtained in practise, though laboratory experiments are very promising. This may be due to mixed infections or to the length of time between the penetration of poison and the treatment.

"5. *Typhus Fever.*— Legrain, during an epidemic in Algeria, used the serum from patients who had suffered from this disease, with good results.

"6. *Cholera.*— Cholera in man is different from that in animals. Nothing definite is known as yet, but Behring announces that he has a curative serum. His researches are not yet published.

"7. *Syphilis.* — Sometimes good results have been effected with the serum from dogs and lambs.

"8. *Streptococcus Infection.*— The serum from animals immunized by vaccination has been employed with good effect in angina, erysipelas, and puerperal fever.

"9. *Cancer.*— There are no satisfactory results so far.

"10. *Tetanus.*— This affection is very hard to cure in animals, and no conclusive results have been obtained in man. The serum, however, acts as a prophylactic agent against tetanus.

"11. *Diphtheria.*— Here it is that the serum treatment has scored its most remarkable triumph. The few accidents that have occurred may be overlooked when we consider the wonderful success that has been attained. Serum treatment has also proved useful in snake bites, and it may have a brilliant future."

**Bacteriological Diagnosis of Typhoid Fever.**— Experimenting upon the elective growth of species of the bacterium coli, Elsner prepared a medium by adding gelatin to an infusion of potato. This was boiled and so reduced in acidity that 10 c.c. of the mixture could be neutralized by 2.5 to 8.0 c.c. of decinormal soda solution. One per cent. of potassium iodide was then added.

Upon the addition of sewage, the colon bacillus grew prolifically, but other bacteria rarely developed to any extent. The typhoid bacillus grew on this medium, but its growth differed so widely from that of the colon bacillus that they could readily be differentiated. At the end of twenty-four hours the colonies of colon bacillus had the same appearance as when grown on other acid media, while the typhoid bacillus colonies were scarcely discernible with low powers. After the lapse of forty-eight hours they appeared as small, light, glistening colonies, having a slightly granular structure.

By the use of this medium, Elsner was able to find the typhoid bacillus in fifteen out of seventeen patients.

**Tubercle Bacilli in Butter.**—The Royal English Commission on Tuberculosis has made a report in which attention is called to the danger of contracting tuberculosis through milk, butter, and meat. Dr. Martin, a member of the commission, states distinctly that the tubercular germs originally found in the milk remain in the butter, and that they give rise to tuberculosis in those eating it. It is becoming more and more evident that milk is an article quite unfit for food without sterilization.

**Germs in Mother's Milk.**—Cohen and Neumann found germs in healthy breast-milk, even after taking every antiseptic precaution in relation to the nipples. Honigmann, Knochenstein, and Palleske have observed pus-producing germs in the milk of a large proportion of nursing women.

**Injection by Pyogenic Micro-organisms and Serum Therapy.**— As the result of extensive experimentation, Parascandolo has found that with an antitoxic serum, prepared by a method similar to that of Roux and Yersin, he is able to cure or to immunize animals exposed to streptococcal and pyogenic infection. The cultures, at first acid, acquire their highest toxicity later, when they become alkaline. He found that dogs, rabbits, and guinea-pigs could be immunized, but the immunity was not permanent. Intra-uterine injections of cultures of streptococcus erysipelatus gave rise to no pathogenic results if the mucous membrane was intact, but if an abrasion was first produced, similar injections gave rise to symptoms of puerperal fever. Injections of antierysipelatous serum had a curative and preventive power against puerperal febril processes, unless these were so far advanced as to poison the whole organism.

**Bacteria of the Nose.**— Thomson and Hewlett (*London Lancet*) have recently made some interesting studies of microbes of the breath, studying especially the function of the nose in relation thereto. According to their observations, an average of fifteen hundred microbes are received into the nose every hour under the most favorable conditions, while in the average city atmosphere (London) the number is ten times as great. Nevertheless, they found, as did Gunning, of Amsterdam, and Strauss, Grancher, Charrin, and others, that expired breath is free from microbes. Experiments made by planting microbes within the nasal cavity showed that they quickly lost their power of growth. The nasal mucus was proved to be capable of preventing the growth of germs, even if it does not destroy them. The larger share of the germs were found to be filtered out by the small hairs which are placed just within the openings of the nose.

**Infection from Books.**— So many well-authenticated cases of disease in which infection was transmitted by means of books, papers, and letters have been reported, that the medical profession are compelled to turn their attention to this evil. With an increasing thirst, upon the part of the general public, for knowledge, there must be a continually growing number of circulating libraries, and consequently a greater chance of infection.

Experiment has shown that pus streptococci, pneumonia diplococci, and the bacilli of tuberculosis and diphtheria and others, when deposited upon the leaves of a book or enclosed in the pages of a letter, are capable, after several days, of transmitting these maladies to animals inoculated by bouillon in which pieces of the leaves have been soaked.

**The Saprophytic Existence of the Tubercle Bacillus.**— It will be interesting to our medical readers to notice some observations recently made upon the possible pleomorphism and former saprophytic existence of the bacillus tuberculosis.

In two cultures of this organism, planted in glycerin agar and kept in an incubator at a temperature of 37.5° C. for six months, Bruns observed that the bacilli had developed in many different forms, some having club-shaped extremities, and others complicated branching shapes, not unlike certain molds. Many intermediate stages between normal and abnormal forms could readily be observed. The microscopic appearance of the colonies in no way differed from the normal; and the abnormal forms, after staining with carbol fuchsin, were not decolorized by twenty per cent. nitric acid.

Bodies undistinguishable from spores were also found in certain of the bacilli. Is it not possible, nay, even probable, that the bacillus tuberculosis has a primary saprophytic existence?

**Pancreatic Ferment in Examination for Tubercle Bacilli.**— Spengler (*Deut. Med. Woch.*) finds it easy to detect tubercular bacilli in the sputum, though present even in very small numbers, by placing the sputum in an incubator with two to fifteen grains of pancreatin. Carbolic acid is added for two or three hours, to prevent putrefaction. After settling for twenty-four hours, the supranatant fluid is decanted, and the sediment examined.

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**The Decline of Antipyretics.** — Twenty years ago, quinine was very strenuously advocated as a means of reducing temperature in fevers, but it was soon discovered that the depressing influence of large doses of quinine upon the heart, and the disposition to cerebral congestion produced by it, are evils which more than counterbalance any possible antipyretic value which it might possess. Later, antifebrin and other coal-tar products were brought forward as specifics for hyperpyrexia, and were for a time extensively used. It was not long, however, before intelligent and observing physicians began to note the extremely depressing influence of these drugs upon the heart, as indicated by the cyanotic appearance and other symptoms of collapse which frequently follow the use of these drugs for reduction of temperature, especially in children.

The writer will never forget a visit to the children's ward of Bellevue Hospital, made during the period when antipyrin was at the height of its popularity as an antipyretic drug. A number of children suffering from fever were pointed out to him by the head nurse as splendid examples of the influence of antipyrin in reducing temperature. A temperature which a few hours before had been from 103° to 105° F., was near the normal point, or in some instances even below normal, but the poor children looked as though they were about ready to expire. Their blue lips, pallid faces, and generally collapsed appearance, indicated a most profound intoxication.

Dr. Lewis Fisher recently contributed to the *Medical Record* a very able article on the treatment of high fever in children, in which he condemned, in toto, the use of antipyrin and similar depressing drugs, recommending instead the invaluable measures of hydrotherapy, which he considers wholly sufficient as an antiphlogistic. Apolysin is a drug somewhat similar to phenacetin, but Dr. Fisher thinks vastly less toxic in character.

**Medical Testimony against the Use of Tobacco.**— Dr. Mulhall, of St. Louis, Mo., recently read before a medical society a paper on cigarette-smoking, a practise which he heartily condemned, especially in young persons. Dr. Ingalls, of Chicago, was outspoken in his condemnation of tobacco in all forms, especially in the form of cigars and cigarettes. He declared that he had seen many persons whose nervous system was seriously affected by indulgence in tobacco, and had also seen chronic inflammation of the throat produced by smoking. Dr. Langmade had so long been accustomed to recognize the ill effects of tobacco-smoking upon the throat, that he was able to tell by examination of the throat alone whether or not an individual was a smoker, and also whether he had abstained for a few days. He called attention to the interesting fact that the best singers abstain from smoking before a public appearance, and that, in some cases, singers have been obliged to abstain from smoking for several weeks before some special effort. He also complained of cigarette-smoking because of the narcotic effect produced by it, to which the smoker becomes readily addicted.

As an evidence of the poisonous effects of tobacco, he referred to a case in which he had applied a solution of nicotin to

the throat of a patient for the relief of a condition which was supposed to be benefited by smoking, but with the most disastrous results, the patient fainting at once, and being revived only with much difficulty.

Dr. Mulhall, who was somewhat of an apologist for tobacco, admitted that "tobacco leads, in a certain degree, to the use of stimulants, . . . owing to the temporary depression produced by smoking, which could be relieved by alcohol." But he held that the combined effect of alcohol and tobacco was very bad in the end. It is thus that the use of one poison leads to that of another. Smoking is only a stepping-stone to alcoholic intemperance.

**A Wise Judge.**— Judge Ferris, of Cincinnati, has announced that he will not issue a marriage license in cases in which either of the parties proposing marriage is an epileptic. Judge Ferris deserves the highest praise for the far-seeing wisdom which has led him to take this noble stand against one of the most efficient causes of the extension of an often incurable, degenerative disease. There ought to be introduced into every State legislature a law rendering illegal the marriage of epileptics, paranoiacs, habitual inebriates, and the defective of all classes.

**Food Poisoning.**—Poisoning by food is unquestionably a much more common cause of illness than is generally supposed. Bowel and intestinal disturbances are usually attributed to the weather, to taking cold, to some epidemic influence, to almost any cause but the right one. Cheese, sausage, game, oysters, mince pie, pickles, and similar foods are very likely to produce stomach and intestinal disturbance, and it is a marvel that any one can at any time eat such unwholesome foods without suffering seriously in consequence. It is only because the healthy stomach is possessed of remarkable disinfecting powers, that such abuse of the digestive organs is possible. If the stomach is overtaxed, however, its disinfecting power is lessened, and the germs taken in with the food rapidly grow, developing poisons, nausea, griping, diarrhea, and various other symptoms as the natural result.

Milk is probably a more frequent cause of stomach and bowel disturbance than any other food. Of specimens of milk recently examined, a small tablespoonful of one contained more than one and a fourth million germs. Another specimen of milk examined on the same day contained but very few germs. The difference was due simply to the difference in the care taken in obtaining the milk from the cow, and in conveying it to the creamery. The milk in the one case contained a thousand times as many germs as in the other, an indication that one of the milkmen must have been guilty of the grossest carelessness. Some of these germs were those capable of producing poisons of a highly dangerous character. Poisons developed from foods sometimes give rise to symptoms which closely resemble various diseases, such as typhoid fever, scarlet fever, pneumonia, cholera, and even metallic poisoning. Too great pains cannot be taken in the care and preparation of food.

**Cold Morning Sponge Bath.**—Every mother ought to know that one of the best means of fortifying children against diseases of all sorts, especially against catarrhs, coughs, sore throats, and the general weakness and good-for-nothingness which is a growing malady among children, is the cool or cold morning sponge bath. It takes a little time and trouble to administer this excellent prescription, but the results will well repay the trouble. This is the way to do it;

Have the bath-room warmed up to a temperature of 75° F. A gas or even a kerosene stove will answer the purpose, if care is taken to ventilate the room, and to avoid occupying it more than a few minutes. It must be remembered that such a stove rapidly consumes oxygen, and contaminates the air. Expose only one half the body at a time. In case of a feeble or very sensitive child, expose only a small part of the body, as an arm or a leg, at one time, keeping the rest of the body covered with a warm woolen blanket. Begin by rubbing the part of the body bathed with a soft crash towel until it is well warmed. Then rub quickly with a sponge dipped in cold water and squeezed so that it is only moist, and afterward for a moment with the hand. Dry with vigorous rubbing, and proceed to another part. Children who are constantly taking cold may in this manner be kept free from colds during the entire winter, and thus escape the chronic catarrh which is coming to be so common among them, resulting in injury to the voice, and frequently loss of hearing and other unpleasant consequences.

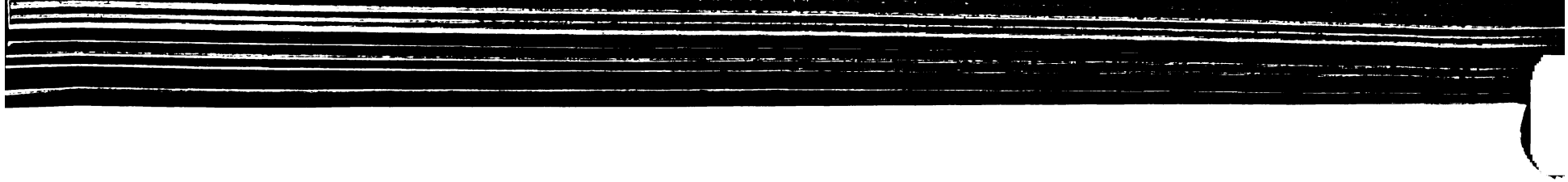
**Immunity from Catarrh.**— A. P. Emery, of Mendon, Mich., who has been for many years engaged in the manufacture of essential oils, gives us the following information concerning the influence of the vapors of essential oils upon catarrh, from which it appears that persons engaged in the business of manufacturing these oils are entirely free from the disease, and if suffering from it when they engage in the work, are soon relieved: —

"If it be a fact that 'colds' are due to 'germs,' and that volatile oils are germ destroyers, then I have discovered the secret that has long puzzled me; viz., that those engaged in the distillation of essential oils in this section of country, such as oil peppermint, spearmint, etc., in the fall of the year, though in open sheds day and night, do not contract colds, and that those who have colds are relieved in a few hours by working over the steaming tubs.

"More or less of the oil vaporized during distillation escapes, and is inhaled by those engaged in and around a mint still. Your vaporizer works on the same principle. I discovered this principle, and the 'great secret' was at once explained to me by reading a description of your vaporizer."

**Bean Cheese.**— A variety of cheese known as *tofu* is much used by the Japanese. It is made from the soja bean, which, after soaking for twelve hours in water, is ground to a uniform pulpy mass, then boiled for an hour in three times its quantity of water, and afterward filtered through a cloth. The milky liquid thus obtained is allowed to stand two or three days, when lactic acid develops, by which the vegetable casein is separated as in sour milk. Ten per cent. of concentrated brine is added by constant stirring, which causes a flocculent precipitate. This is separated by a cloth filter, and is formed into tablets by a slow pressure. *Tofu* is eaten in the form of soup and in many other ways. The solid nutriment which it contains amounts to only about ten per cent. Sometimes the greater part of the water is separated by freezing, and the block of frozen *tofu* afterward allowed to thaw in the sun. When prepared in this way, the proportion of solid nutriment, chiefly fat and vegetable casein, is nearly eighty per cent.

**Fingers and Toes of Criminals.**— Dr. P. Penta has studied the fingers and toes of four thousand five hundred criminals, and finds a deficiency in the size or number of toes quite frequent among them, although very rare among ordinary men. He has also observed that pre-



hensile toes, marked by a wide space between the great toe and the second toe, is a condition quite common among criminals, also a webbed condition of the toes, an approximation to the toeless feet of some savages. He found the little toe rudimentary in many cases, showing a tendency toward the four-toed animal foot. The most common of all the abnormalities was the webbed condition of the toes. These observations agree with those made by various investigators, who have found other deformities existing among the criminal classes, particularly misshapen heads, one-sided faces, mismated ears and eyes, etc. The criminal is a degenerate type.

**Cure of Tic Douloureux.**— This persistent and aggravating disease is never cured by neurotomy, but the writer has succeeded in effecting a radical cure in four cases by simple methods which he believes will be found successful in nearly all cases. In the first place, it should be stated that in each of the four cases treated, there was found dilatation of the stomach, with extreme hyperesthesia of the lumbar ganglia of the sympathetic and the solar plexus. The tongue was exceedingly foul, and there was every indication of disordered digestion and the production of toxic substances in the stomach and perhaps other portions of the alimentary canal. An aseptic dietary, accompanied by rational hydrotherapy, resulted in the clearing of the tongue in each of these cases, as well as in improvement of both the digestion and the general health. Permanent recovery occurred in one case without the employment of other measures. In the other three cases, an injection of from five to ten minims of chloroform was made at the painful points. The disease affected the right side of the face in all four of these cases. In one, the injection of chloroform was followed by a neuritis of short duration, and subsequent paralysis of the facial muscles, from which, however, complete recovery occurred within a few weeks. A non-flesh dietary, the employment of dry food, avoidance of milk, systematic lavage, and the use of charcoal and other intestinal antiseptics were the principal measures addressed to the stomach. The writer's observation has been, that in this difficulty recovery rarely, if ever, occurs without removal of the gastric disorder, which is, doubtless, in a majority of cases, the exciting cause of the disease.

**Bacteriology of Butter.**— The farmers of Denmark have taken advantage of the developments of modern bacteriology in the manufacture of butter. The Danish bacteriologists having determined the particular microbes by which the various flavors are developed in butter, the farmer is now able, by sterilizing his milk, and then planting that particular species of microbe by which the desired flavor is produced, to furnish a uniform quality of butter of any desired flavor. The dairymen of Denmark have by this means succeeded in obtaining almost complete control of the English market.

Now that we have the means of knowing the exact varieties of germs which butter contains, we may be able to study with some degree of accuracy the influence of this article of food upon digestion.

**Tobacco-Using.**— In another column we publish an excellent paper by Professor Gilbert, of Louisville, Ky., on preachers and tobacco. We heartily endorse all Professor Gilbert says against the use of tobacco by anybody, and especially by preachers. Tobacco-using is one of the most pernicious and filthy of habits. Of all men, physicians and preachers ought to be free from it, and to set a good example before the community, especially the rising generation.

# REVIEWS.

ON DIGESTIVE PROTEOLYSIS.—By R. H. Chittenden, Ph. D., New Haven, Conn. Tuttle, Morehouse & Taylor, publishers.

This work is a reprint of the Cartwright Lectures delivered by Professor Chittenden, professor of physiological chemistry in Yale University, before the Alumni Association of the College of Physicians and Surgeons, New York City. The work is a most exhaustive treatise on the important subject which it considers, presenting all that is known of it up to a recent date. It should be in the library of every progressive physician who desires to deal with all cases of indigestion and disturbed nutrition in an intelligent and rational manner. We are glad to note the author's recognition of the important fact pointed out by Hayem and Winter several years ago in their work entitled "Du Chimisme Stamacal;" namely, that in the examination of the stomach contents after a test meal for the purpose of determining the value of the chemical work done by the stomach, it is highly important to know the amount of combined chlorin present, as well as the amount of free hydrochloric acid. This fact seems to have been almost overlooked by Ewald, Boas, and other investigators, doubtless because their method of examination of the stomach fluid, as well as all others which have been tried, with the exception of the excellent one employed by Hayem and Winter, is incapable of accurate determination of the amount of combined chlorin present in a given stomach fluid. The author also points out the fact that perfect digestion may take place in the absence of free hydrochloric acid, which is another illustration of the incompetency of those methods of investigation which do not take account of the combined chlorin as well as the free hydrochloric acid and the total acidity. The writer of this notice has often called attention to the method of Hayem and Winter in the columns of this journal, and having tested it in the investigation of more than six thousand stomach fluids, is well convinced of the correctness of Professor Chittenden's observations.

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SOME SYMPTOMS WHICH SIMULATE DISEASE OF THE PELVIC ORGANS IN WOMEN, AND THEIR TREATMENT BY MASSAGE.—By A. Rabagriati, M. A., F. R. C. S., New York. Wm. Wood & Co.

The author of this work has made the discovery that a large number of the morbid conditions from which women suffer, and which are generally supposed to indicate neurosis or inflammatory infection of the pelvic organs, are really not fundamentally due to disease of the nervous system, nor indeed to primary disease of the genital organs, but to other maladies which express themselves through the nervous system. The author considers that, in the majority of cases, the primary seat of the disease is not the nerves, but the muscles, or the muscle-sheath, the nerve-sheath, and the periosteum, or bone-sheath. While we do not find the evidence presented sufficient to support the author's theories, we nevertheless agree with him in his protest against the popular notion that every pain from which a woman suffers in the pelvic region arises from a nervous or other functional or structural disease of the womb or ovaries.

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HAND-BOOK OF DENTAL PATHOLOGY.—By A. N. Blodgett, M. D., Philadelphia. P. Blakiston, Son & Co.

The author's apology for this work, which is intended for students and practitioners of dentistry, is the fact that there has heretofore existed no textbook upon the subject of dental pathology in which the subject was treated in a satisfactory manner. The work is an excellent one, and to be commended not only to students and practitioners of dentistry, but to the members of the medical profession, who, as a class, ought to be better informed than they are in respect to dental pathology. The author recognizes the microbial origin of caries, although the facts at his command were few as compared with our knowledge of the subject at the present time. The admirable work, "Les Microbes de la Bouche," by David, has thrown a great flood of light upon this question, which cannot fail to be of great service to dental science.

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ALCOHOL IN LA GRIPPE.—By Charles H. Sheppard, M. D., Brooklyn, N. Y.

This author contends that alcohol has no place in the treatment of la grippe, but that, on the contrary, the extensive use of alcohol in this country is a predisposing cause of the disease. The author recommends, on most excellent grounds, the use of the Turkish bath as a remedy in that form of influenza known as la grippe. No one has had more extensive practise in the use of the Turkish bath than has Dr. Sheppard, and he is entitled to speak with authority on this subject.

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POLIOMYELITIS AND LATERAL SCLEROSIS.—A clinical lecture delivered by J. E. Eskridge, M. D., Denver, Colo.

This is an interesting account of a case of lateral sclerosis and progressive muscular atrophy following an attack of poliomyelitis which occurred in an epidemic form twelve years previous. This paper, like everything that Dr. Eskridge writes, is interesting and practical in character.

# The Battle Creek Sanitarium
# LABORATORY OF HYGIENE.

J. H. KELLOGG, M. D., Superintendent.
GEO. W. BURLEIGH, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
A. B. OLSEN, B. S., M. D., Pathologist.
W. A. GEORGE, M. D., Chemist.

**Monthly Resumé of Work Done.**

## REPORT OF EXAMINATION OF BLOOD.

FOR APRIL.

| Blood Count. | Men. | Women. | Total. |
|---|---|---|---|
| Over, or 5,000,000 | 3 | | 3 |
| Between 4,500,000 and 5,000,000 | 59 | 2 | 61 |
| " 4,000,000 " 4,500,000 | 14 | 43 | 57 |
| " 3,500,000 " 4,000,000 | 2 | 6 | 8 |
| " 3,000,000 " 3,500,000 | 1 | 1 | 2 |
| Totals | 79 | 52 | 131 |

| Hemoglobin. | Men. | Women. | Total. |
|---|---|---|---|
| 100 per cent. | 31 | 8 | 39 |
| 93 " " | 41 | 38 | 79 |
| 85 " " | 6 | 5 | 11 |
| 78 " " | | 1 | 1 |
| 71 " " | 1 | | 1 |
| Totals | 79 | 52 | 131 |

**Report from Urinary Laboratory for April.**— Number of specimens examined, 337; cases, 226. Number of specimens containing pus, 64; albumin, 23; blood, 10; casts, 3; sugar, 4; bile, 2. Cases examined for toxicity, 6. Lucine and tyrosin crystals were found in one specimen.

**Microscopical Examination of Sputum for April.**— Number of examinations made, 66; number of cases, 42; number of cases in which tubercle bacilli were found, 6.

Patients whose sputum contained tubercular germs were from the following States: Michigan, 3; Texas, 1; New York, 1; Indiana, 1. Total, 6.

**Gastric Laboratory Report for April.**— Regular chemical analysis of the stomach fluid was made in 150 cases; experimental analyses, 5. Total, 155.

The number of patients from each State was as follows: —

Michigan, 65; Illinois, 26; Iowa, 10; Minnesota, 7; Ohio, 6; Kentucky, 3; Tennessee, 3; New York, 3; Maine, 2; Indiana, 2; Wisconsin, 2; Kansas, 2; Texas, 2; Canada, 2; Alabama, 2: Colorado, 1; Mexico, 1; Maryland, 1; Nebraska, 1; Massachusetts, 1; Pennsylvania, 1; District of Columbia, 1; Oklahoma, 1. Total, 145.

**Oysters and Feeble Digestion.**— One of the interesting observations made recently in the bacteriological department of the laboratory was in relation to the number of microbes in oyster juice. It was found that 1 c.c. of oyster juice produced, in an agar culture, 1,500,000 colonies. This observation entirely justifies the position of the late Dujardin-Beaumetz, one of the most eminent of French physicians, that oysters should never be eaten by persons with feeble digestive powers or those suffering from dilatation of the stomach. There is no article of food which decomposes more readily in the stomach than does the oyster, and none more likely to communicate infection through the setting up of decomposition and fermentation in other foods. The oyster is always a carrier of microbes, and recent observations show that it often communicates typhoid fever and other pathological germs.

# PUBLISHERS' DEPARTMENT.

A SYSTEM OF SANITARIUMS.—The managers of the Battle Creek Sanitarium have, within the last thirty years, built up a splendid medical institution, probably the most extensive and thoroughly scientific establishment of the kind in the world. Their constant aim has been to keep in line with, and make a proper application of, every new development in the way of medical progress. A liberal policy has led the management to adopt broad plans for their work, as the result of which they have undertaken to extend the advantages of their institution to various parts of the United States.

In addition to the branch sanitarium located at Chicago, which is in immediate connection with the institution at Battle Creek, sanitariums have been recently established and are now in operation at College View, a suburb of Lincoln, Neb.; at Boulder, a beautiful mountain town near Denver, Colo.; and at Portland, Ore. An institution conducted in harmony with the same general plan, has, for a number of years, been located at St. Helena, Cal. It was first organized as a private enterprise by a physician who had been connected with the institution at Battle Creek, and has since been taken under the same general management.

In addition to these six institutions in the United States, sanitariums under the same general management are now being erected in Guadalajara, Mexico, and at Cape Town, South Africa. The work at Guadalajara is already in operation, in rented buildings, and the institution at Cape Town will be opened about the first of next September.

These institutions are all organized as self-supporting philanthropic enterprises. None of them are conducted for profit. The persons connected with them, whether as managers, physicians, nurses, or ordinary employees, either donate their services entirely, or render them for a nominal compensation, all the profits accruing from the treatment of patients able to pay, being devoted to the care of the worthy poor, the extension of facilities, and other necessary improvements.

The medical profession everywhere are coming to recognize, more and more, the necessity for sanitariums. There is a large and increasing class of chronic invalids whose maladies are of such a nature that a cure can be effected only by a combination of medical treatment and hygienic care and training. This sort of treatment requires skilled assistants, under the direction of physicians who have had especial training for the work.

Quite an army of help is required for the perfect carrying out of all the details connected with a large sanitarium; for example, the institution at Battle Creek, which is perhaps the most thoroughly organized enterprise of the sort in the world, employs from four hundred and seventy-five to six hundred persons continually, the number varying somewhat at different seasons of the year, including twenty physicians, and over two hundred and fifty nurses and bath attendants. The institution has several hundred thousand dollars invested in facilities and appliances, which include extensive farms containing over five hundred acres, nearly all of which is under a high state of cultivation. There are orchards; fruit and vegetable gardens; green-houses for supplying the institution with flowers in the winter season, and for starting plants for the flower-beds in the summer season; extensive bakeries for the production of health foods; the largest and most thoroughly equipped bath-rooms in the United States; extensive apartments for the application of Swedish movements; a large gymnasium; extensive laboratories for making scientific investigation into the nature and cause of disease; etc., etc.

Such extensive facilities cannot be afforded in every town, and perhaps not in every State; but many smaller establishments in which the same principles can, by the aid of well-trained assistants, be employed in the treatment of the sick, have long been needed in various parts of the United States. The management of the Battle Creek Sanitarium have undertaken to supply this want as rapidly as they can develop competent persons to superintend and conduct them.

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THE Detroit and Cleveland Steam Navigation Company's steamers are now running daily (except Sunday) between Detroit and Cleveland. When traveling East or West, North or South, try to arrange to take advantage of these luxurious steamers between Michigan and Ohio. If you are contemplating a summer outing, write A. A. Schantz, G. P. A., Detroit, Mich., for illustrated pamphlet, which gives full information of a trip to Mackinac via the Coast Line.

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HYDROZONE IN PURULENT OTITIS MEDIA.—On Nov. 4, 1894, I was consulted at my office by Robert P——, aged twenty-four years; occupation, laborer in the Armour Packing Company. The patient complained that for about four weeks he had been suffering from intense pain in his left ear, making it impossible for him to sleep at night or rest during the day. The pain was so severe that at times he lost consciousness, and it seemed to extend through his entire brain.

Upon inspection, the man's face was found terribly deformed; an edematous swelling the size of one half of an ordinary loaf of baker's bread occupied the usual location of the ear and the surrounding muscles. The auricle of the ear was almost buried in edematous tissue; upon palpation the part was found intensely tender, and deep pressure evoked expressions of excruciating pain. The integument and subcutaneous tissue were thoroughly infiltrated. Ichorous, fetid pus was slowly exuding from an almost imperceptible meatus. The patient expressed feelings of chilliness, showing a possible septic contamination of his system. Every indication and sign pointed to possible suppuration of the mastoid cells, tenderness upon pressure over the mastoid being very marked. Efforts to localize the tenderness, whether in the external meatus or the mastoid, for discriminating diagnosis, were unsatisfactory.

I concluded to withhold a positive diagnosis as to whether the condition was purulent otitis media or suppurative inflammation of the mastoid, and used tentative treatment for a short time. I immediately placed the patient under heroic doses of elixir of the six iodides internally. After laborious effort, I succeeded in separating the edematous tissue sufficiently to admit the introduction of a small Eustachian catheter into the external meatus. Through this, with a small, hard-rubber syringe, I injected four times daily about one half an ounce of hydrozone, allowing it later to drain away, advising hot fomentations. The patient was confined to his bed, and the best possible hygienic surroundings provided.

In twenty-four hours after the treatment was begun, the intensity of the odor and the amount and character of the discharge had manifestly less-

ened, the swelling was reducing, and the patient feeling better. The edema being lessened, the aperture was enlarged. I now recommended the injection of hydrozone through a catheter of larger caliber, every hour, requiring the head to be kept turned to the opposite side for ten minutes to allow the percolation of the hydrozone as deeply as possible into the middle ear before reversing the position to allow drainage.

We continued this treatment for a week, the man's recovery progressing with remarkable rapidity, his pain and the constitutional symptoms having disappeared about the third day. At the end of eight days the swelling had entirely disappeared, his features were again normal, and he expressed himself as perfectly well. An examination showed a circular perforation in the ear-drum the size of a shot, proving that the case had been one of purulent otitis media, with septic contamination of the patient's system, and infiltration of the surrounding cutaneous tissues. Small incisions were made at two different places to permit the exit of pus from the integument. The mastoid was found not involved.

The rapidity with which the disease yielded after the introduction of hydrozone through the catheter into the middle ear impressed me with the wonderful value of the preparation ; for, struggling with such cases during a practise of seventeen years, I have never seen its efficiency equaled by any medicinal or operative procedures.— *Wm. Clarence Boteler, M. D., in Medical Bulletin.*


# Caramel-Cereal

**FOR THE LAST TWENTY YEARS,** has been used by the thousands of invalids who annually visit the great Sanitarium at Battle Creek, Mich.

**UNCONSCIOUS POISONING.**—An old physician of Chicago remarked the other day: "Thousands of people are poisoning themselves daily with tea and coffee without knowing it. A great number of nervous maladies, and indigestion in various forms, are the result of the deleterious effects of the poison of tea and coffee upon the system. I myself made the discovery a good many years ago, that the headaches from which I had suffered for years, were due to the use of tea and coffee. I found whenever I took a cup of strong coffee, I had a headache as the result, and I had headaches now and then in spite of what I considered my great moderation in the use of tea and coffee. I concluded to dispense with them altogether, and when I did so, my headaches disappeared and did not return. I have cured scores of chronic headaches by forbidding the use of tea and coffee."

**CARAMEL-CEREAL** is a perfect substitute for tea and coffee. It is aromatic, delicious to the taste, and so nearly resembles coffee as easily to be mistaken for veritable Mocha, although, of course, not by a connoisseur.

For illustrated catalogue and prices, address,

**BATTLE CREEK SANITARIUM HEALTH FOOD CO., Battle Creek, Mich.**

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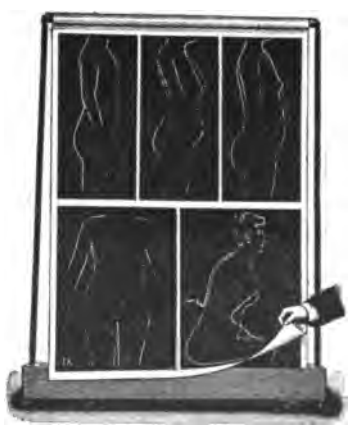

THE following expression regarding the value of Dr. Kellogg's "Outline Studies of the Human Figure," is from Jay W. Seaver, A. M., M. D., President of the Chautauqua School of Physical Education, and Medical Director of the Yale University Gymnasium: —

"Dr. Kellogg's 'Outline Studies' I am sure will prove to be very helpful to any person who is studying the human body, or who is teaching personal hygiene. These outlines should be widely introduced into public schools, where their mere presence on the walls would be a constant object lesson."

## MODERN MEDICINE PUBLISHING CO.,

BATTLE CREEK, MICH.

# DIRECTORY OF SANITARIUMS.

THE following institutions are conducted under the same general management as the Sanitarium at Battle Creek, Mich., which has long been known as the most thoroughly equipped sanitary establishment in the United States. The same rational and physiological principles relative to the treatment of disease are recognized at these institutions as at the Battle Creek Sanitarium, and they are conducted on the same general plan. Both medical and surgical cases are received at all of them. Each one possesses special advantages due to locality or other characteristic features.

## ST. HELENA SANITARIUM, OR RURAL HEALTH RETREAT,

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W. H. MAXSON, M. D., Superintendent.
IRVING E. KECK, Business Manager.

THIS institution is beautifully located at the head of the Napa Valley. It is a fine large building, with excellent appointments, and all facilities required for the treatment of chronic invalids of all classes. It has also a record for a large amount of successful surgical work. There are several able physicians connected with the institution. The scenery is delightful, the climate salubrious; the water supply, which is furnished by mountain springs, is pure and abundant. Hundreds of cases of diseases generally considered incurable have been successfully treated at this excellent institution during the twenty years of its existence.

## CHICAGO SANITARIUM,

28 COLLEGE PLACE, CHICAGO, ILL.

THIS institution is a branch of the Battle Creek (Mich.) Sanitarium. It is favorably located near Lake Michigan, in the southern portion of the city, close to Cottage Grove avenue, and facing the old Baptist University grounds. A few patients are accommodated. Facilities are afforded for hydrotherapy, and the application of massage, electricity, Swedish movements, and other rational measures of treatment.

## NEBRASKA SANITARIUM,

COLLEGE VIEW (LINCOLN), NEB.

A. R. HENRY, President.
A. N. LOPER, M. D., Superintendent.

COLLEGE VIEW is a thriving village located in the suburbs of Lincoln, with which it is connected by an electric railway. College View is the seat of Union College, one of the leading educational institutions of the West. The Sanitarium has a beautiful location, facing the spacious college grounds, and gives its guests the advantages of a quiet, homelike place, combined with appropriate and thoroughly rational treatment. It has a full equipment of excellent nurses, and has already won for itself an enviable reputation in the West.

## PORTLAND SANITARIUM,

PORTLAND, ORE.

L. J. BELKNAP, M. D., Superintendent.

THIS institution is beautifully located in the center of the city, in a fine building with spacious grounds; and although it has been in operation scarcely more than a year, it already has a good patronage, and has evidently entered upon a successful career. Facilities are provided for the dietetic and medical treatment of chronic ailments of all kinds. The advantages for treatment include, in addition to various forms of hydrotherapy, electric-light baths, and apparatus for the application of electricity in its various useful forms, manual Swedish movements and massage.

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# Directory of Sanitariums.—Continued.

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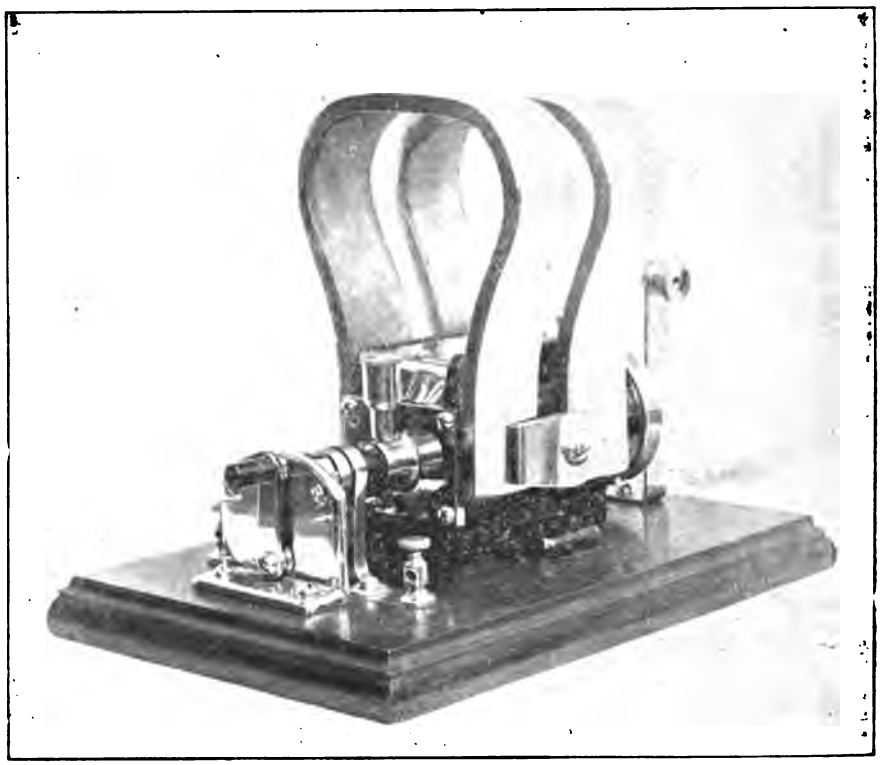

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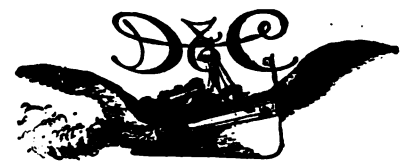

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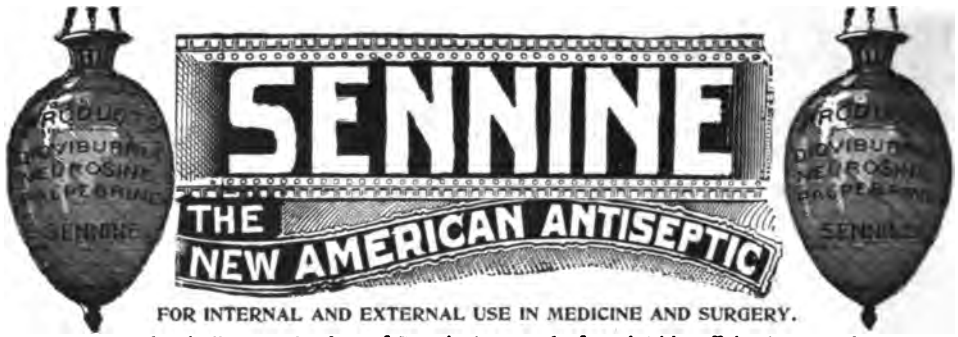


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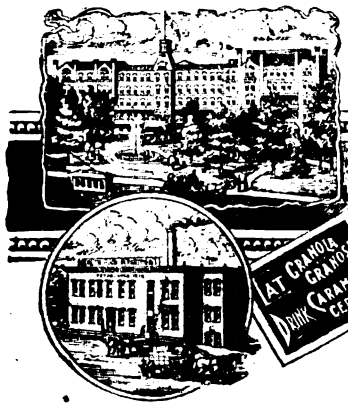


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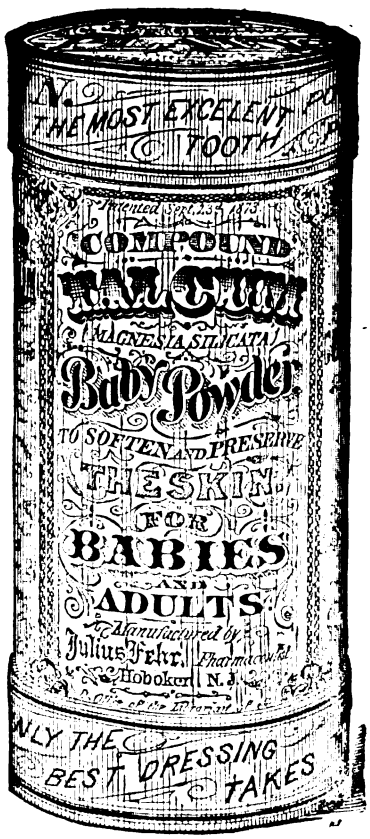

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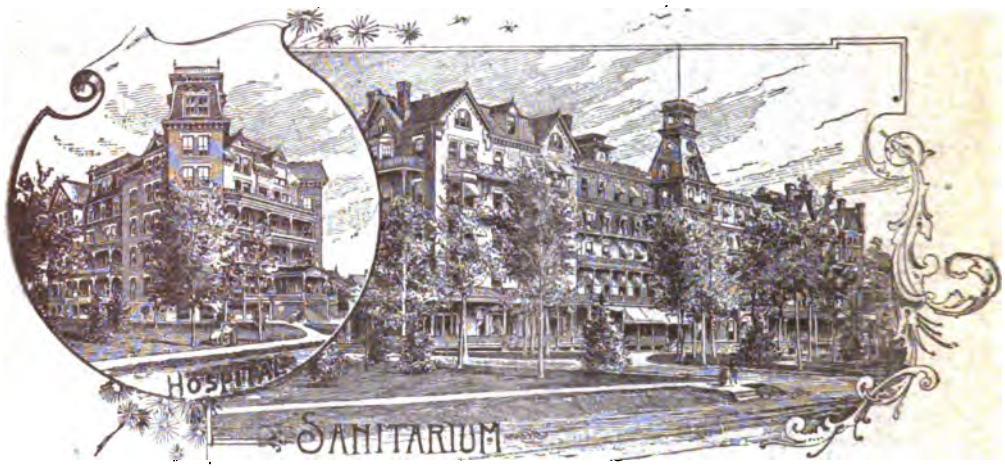


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# MODERN MEDICINE AND BACTERIOLOGICAL REVIEW.

Bulletin of the Sanitarium Hospital and Laboratory of Hygiene.
SANITARIUM, BATTLE CREEK, MICH.

Edited by J. H. Kellogg M.D.

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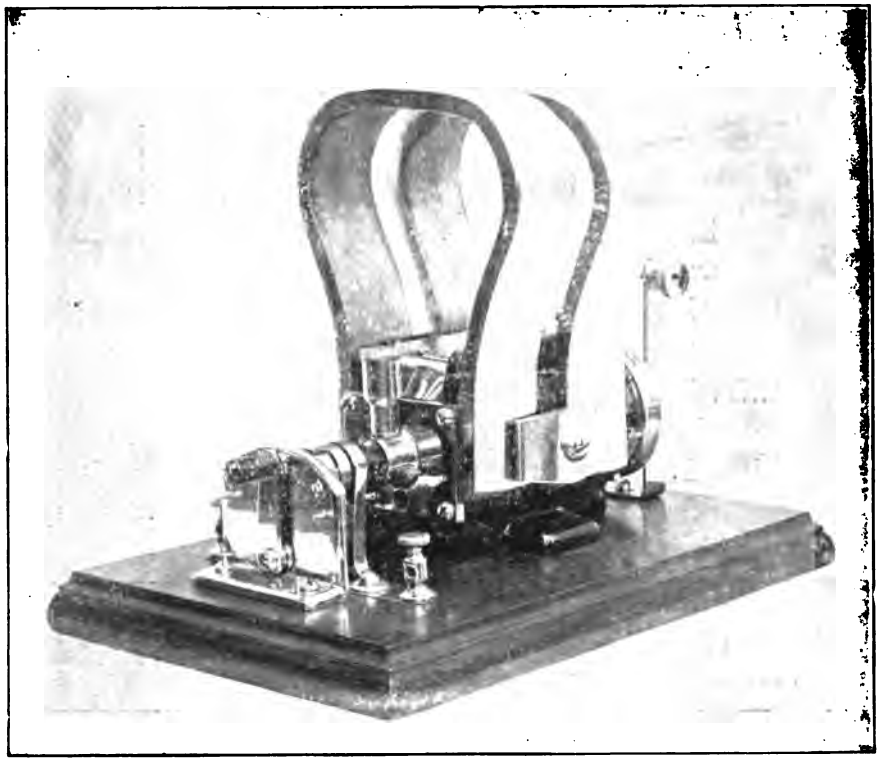

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| GOING EAST. Read down. | | | | | STATIONS. | GOING WEST. Read up. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 10 Mail Ex. | 4 L'v'd Ex. | 6 Atl. Ex. | 42 Mixd Tr'n. | 2 Pt. H Pass | | 11 Mail Ex. | 1 Day Ex. | 3 R'd L'v'd | 28 B. C. Pass. | 5 P'ke Ex. |
| a m | p m | p m | | | | p m | p m | p m | | a m |
| 9.00 | 5.10 | 8.15 | a m | ..... | D. Chicago. A | 6.45 | 1.50 | 9.10 | ..... | 6.30 |
| 11.25 | 5.05 | 10.30 | 6.00 | ..... | Valparaiso | 5.05 | 11.35 | 7.10 | ..... | 4.30 |
| p m | | | | | | | | | | |
| 1.05 | 6.30 | 12.00 | 10.05 | ..... | South Bend | 3.10 | 10.15 | 5.44 | ..... | 3.07 |
| 1.46 | 7.12 | 12.45 | 12.40 | ..... | Cassopolis | 2.15 | 9.40 | 5.13 | ..... | 2.25 |
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| 2.44 | 7.55 | 1.46 | 4.50 | a m | Vicksburg | 1.10 | 8.52 | ..... | p m | 1.30 |
| 3.30 | 8.36 | 2.40 | 6.20 | 7.00 | Battle Creek | 12.15 | 8.15 | 3.55 | 9.35 | 12.50 |
| 4.38 | 9.26 | 3.25 | ..... | 7.47 | Charlotte | 11.14 | 7.28 | 3.07 | 8.40 | 11.55 |
| 5.10 | 9.55 | 4.00 | ..... | 8.20 | Lansing | 10.40 | 6.55 | 2.40 | 8.00 | 11.25 |
| 6.30 | 10.45 | 5.08 | ..... | 9.30 | Durand | 9.35 | 6.05 | 1.55 | 6.50 | 10.25 |
| 7.30 | 11.17 | 5.40 | ..... | 10.05 | Flint | 8.35 | 5.35 | 1.25 | 6.47 | 9.30 |
| 8.15 | 11.50 | 6.15 | ..... | 10.43 | Lapeer | 7.49 | 5.02 | 1.00 | 5.10 | 9.05 |
| 8.42 | a m | 6.35 | ..... | 11.05 | Imlay City | 7.25 | ..... | ..... | 4.48 | ..... |
| 9.50 | 1.00 | 7.30 | ..... | 12.05 | Tunnel | 6.50 | 3.50 | 11.55 | 3.50 | 7.55 |
| | p m | | | | | a m | a m | a m | p m | p m |
| 9.25 | ..... | ..... | ..... | ..... | Detroit | ..... | ..... | 10.40 | 4.05 | 8.00 |
| | a m | p m | | | | | p m | | | p m |
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| | p m | a m | | | | | a m | | | |
| ..... | 8.15 | 7.25 | ..... | ..... | Montreal | ..... | 9.15 | ..... | ..... | ..... |
| | a m | p m | | | | | a m | | | |
| ..... | 8.12 | 7.15 | ..... | ..... | Boston | ..... | 8.30 | ..... | ..... | ..... |
| | a m | p m | | | | | p m | a m | | p m |
| ..... | 7.50 | 4.25 | ..... | ..... | Susp'n Bridge | ..... | 10.15 | 7.05 | ..... | 2.05 |
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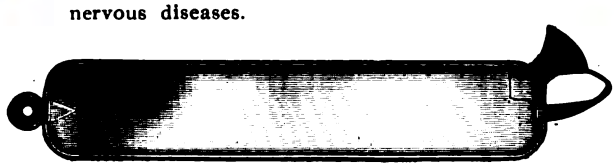

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# MODERN MEDICINE

• • AND • •

## BACTERIOLOGICAL REVIEW.

VOL. V. BATTLE CREEK, MICH., U. S. A., JUNE, 1896. NO. 6.


## ORIGINAL ARTICLES.

### THE VAGINAL DOUCHE.


BY BYRON ROBINSON, B. S., M. D.,
Professor of Gynecology in Post-Graduate School, Chicago, Ill.


THE therapeutic effects of the vaginal douche may be stated as follows:—

1. It contracts tissue: (1) muscular tissue, (2) connective tissue, (3) elastic tissue.
2. It contracts vessels: (1) arteries, (2) veins, (3) lymphatics.
3. It checks secretions.
4. It hastens the absorption of exudates.
5. It allays pain.
6. It cleanses the parts.
7. It is a stimulant.
8. It furnishes a means for the application of heat and medicaments to a wide surface.

In other words, both the objects in giving a douche and its effects may be various. It may be intended simply to cleanse the parts, in which case plain water suffices; or if it is desired to influence changes in the adjacent parts, heat as well as medicine in a fluid form may be applied to the parts by means of the douche. The three objects may be accomplished by the one douche, by adding heat and medicaments. Nothing in gynecology is either so widely advised by the physician or so often taken up by the patient herself.

We may first consider the subject of cleanliness. Who should use a vaginal douche?— It may be asserted safely that a healthy woman does not need a douche. No doubt it would conduce to cleanliness during the menstrual flow to use a douche of a gallon of warm water once a day; but it is probable that a healthy vagina does not really require it any more than a healthy rectum or a healthy bladder. I am inclined to think that it would, in general, be conducive of more harm than good, to have healthy, unmarried women using a douche at the time of the menstrual flow; for in menstruation the greater part of the secretions which show decomposition are brought to the vulva, whence they can be washed away by external ablutions.

Should pregnant women employ a douche? — In certain cases of considerable vaginal secretion during pregnancy, I have for years employed a douche of six to eight quarts of warm water daily. As a result, the secretions are lessened, the edema and the reddened vulva disappear, and the patient becomes more comfortable. It is of course known that the vaginal secretion, by its acidity, furnishes a medium to preserve itself against pathogenic infection, and by the continual douche the pathogenic bacteria may also be washed away. On the whole, I am inclined not to order a douche during normal pregnancy, with no excessive secretions. However, in cases in which the condition was accompanied by a very considerable flow, I have many times ordered a vaginal douche of two to four quarts daily, with satisfactory results.

The use of a vaginal douche for actual disease should be carried out systematically and regularly. A fountain syringe should be used, and the patient should lie on the back. A married woman may begin with two quarts of water, a little more than blood heat, taking the douche morning and evening. The heat should be gradually increased in the course of a week, until it is as hot as can be borne. The quantity of water may be increased a pint each time, until a gallon is used, when a handful of common salt (Na Cl) and a teaspoonful of alum may be added. The salt is a physiological remedy, and avoids unpleasant reaction, while alum astringes the tissues and checks secre-

tions. I instruct the patient to increase the douche until twelve quarts of water is reached, three handfuls of salt and three teaspoonfuls of alum being added to this quantity. The patient now takes the twelve quarts required morning and evening, but if taken only once daily, it should be at bedtime. It is very convenient, when twelve quarts are employed, to use a twelve- or fourteen-quart pail instead of repeatedly filling the syringe, for if no attendant is present, it is very disturbing to the patient to get up and down to fill it. The duration of the vaginal douche should be ten minutes for every gallon, and the reservoir should be placed three to five feet above the patient. A convenient method for giving a douche is to use an ironing-board tilted several inches higher at the head than the feet, allowing the fluid to trickle into a pan, care being taken not to wet the clothing. It will be remembered that diseased genitals may sometimes be approached better through the rectum than the vagina; but the rectum does not tolerate douches as the vagina does. Hence I cautiously increase the rectal douche from one pint up to six pints, as the patient can bear it. Seldom will the rectum bear any large douche except plain water. I have obtained very satisfactory results by using both the rectal and the vaginal douche in cases of diseased genitals. It also helps to remove constipation.

Young unmarried women should begin with only a quart of lukewarm water, and in the beginning use it only once daily. To begin with large hot douches unbalances the nervous system, making the patient irritable, sick at the stomach, and languid, and sometimes produces a mild shock. I do not employ cold douches, and cannot recommend them. When the hot douche burns or smarts, there are liable to be abrasions, and interruptions of the continuity of tissue. In such cases, vaseline or sweet-oil may be applied to the parts before the douche is used. In general, a patient should lie down at least half an hour to an hour after taking a douche.

The effect of the douche on the several pelvic organs may be briefly noted as follows: —

1. The vagina may be inflamed, red, and exceedingly tender. Vaginitis in general is nearly always specific, gonorrheal. The vulva is swollen, the vulvo-vaginal glands irritated to a severe hypersecretion, and the patient suffering from excoriations. A plain hot douche of two quarts from one to three times daily is very effectual in these cases. The douche may be rapidly increased in quantity, but gradually in heat. The heat permanently decongests the dilated, partially paralyzed vessels, and induces them to contract, preventing stasis. Acrid, excoriating secretions, with decompositions producing severe irritation, are washed away by the douche. The most effective therapeutic agent for the pendulous, flabby vagina is the hot twelve-quart douche, morning and evening, with three handfuls of salt and three teaspoonfuls of alum added. Marvelous contractive effects can be produced on the vagina in a month's time, by the use of the douche.

2. The atrophic or non-developed uterus is very much benefited by the twelve-quart vaginal (and gallon rectal) douche twice daily for a period of from six to twelve months. This measure, combined with the glycerine tampon, will frequently restore the regularity of the menstrual period, lessen pain, and produce a very considerable enlargement in the uterus. The heat acts in such a stimulating manner that the uterus attempts to regain its natural size. The non-developed uterus in the young girl may be developed by rectal douches. Yet if distinctly small, the hymen should be stretched sufficiently to allow not only the vaginal douche, but the tampon. It requires, however, persistence for many months in order to be effective.

Metritis is the one disease in which the douche produces good and permanent effects if long persisted in. In cases of an enlarged, thick-walled uterus, made hard by the deposit of much connective tissue, with excessive congestion, venous and arterial, accompanied by dragging sensations and increased menstrual flow, as well as various neurotic symptoms, the large, hot douche acts well. If the menstrual flow is scant, it may be corrected and increased by the douche. The chief effect of the douche is on the circulation, by means of the nervous system. The douche is a stimulant, and as such, tends to aid nature in recovery. From the hyperemic uterus to the uterus of subinvolution, the douche is effective; by its continuation the uterus becomes reduced, the blue congestion gives place

to a natural red color, the secretions diminish, the dragging pain becomes less, and the neurosis gives place to a more normal condition of the nerves. The douche aids nature in the process of cure, whether the disease of the uterus be rigid metritis or flabby subinvolution, because its therapeutic effect is to correct viscous circulation through a corrected nerve balance.

A distinction should be made between an infantile uterus and an atrophic uterus. An infantile uterus has never been developed, and the douche will be of no particular value; but an atrophic uterus has once been developed, and to a certain extent the douche will restore it to its former state. In more than one case where I have treated an atrophic uterus with a douche for eight to twelve months, the patient has been rewarded by conception. The glycerine tampon was also used in such cases once a week.

3. In regard to disease of the tubes, it is closely associated with exudates and cicatricial deposits. Any one who has followed gynecology as a specialty for ten years is well aware how the douche hastens the absorption of exudates of even organized bands, the so-called perimetritic exudates. In other words, we are really, in these cases, treating the results of pelvic peritonitis, and the well-conducted hot douche is found very effective in reducing old peritonitic deposits. It seems to me that the douche of a few quarts, as employed by many of the German physicians, is of very limited use. In acute tubal inflammations, or pyosalpinges, large, hot douches are liable to do harm. The sac may burst, or the heat may irritate the inflamed tubes, inducing excessive tubal peristalsis.

In hemorrhages, however, the hot douche is invaluable. It has a styptic effect; it contracts tissue; it narrows the visceral lumina; it checks the oozing from the endometrium. Profuse menstruation may be checked by the hot douche, as the waste of blood is pure loss, whether it be from menstruation or from metrorrhagia. Large, hot douches even in bleeding myomas are very effective.

In regard to the addition of medicaments to the douche, some exercise of judgment is required. For example, it is easy even for a novice in gynecology to observe that there are two kinds of vaginitis; viz., (1) merely hypersecretion, (2) suppurative vaginitis.

Now, for this hypervaginal secretion, or vaginitis seborrhea, some astringent is needed, as alum or tannin, one per cent. Hot douches containing alum or tannin in vaginitis seborrhea quickly affect the vagina by contracting its walls and narrowing its lumen. The alum and tannin do not irritate the pathological condition in vaginitis seborrhea, and Na H $CO_3$ as well as Na Cl is a good adjuvant. But in suppurative vaginitis, which is almost always gonorrheal, the sensitive granulated vagina cannot bear any irritating astringents. In granular vaginitis (vaginitis gonorrhea, or granulosa) the plain douche is all that should be used. If the patient be in a hospital, bichlorid or carbolic acid may be used; but I think that mercurial bichlorid and carbolic acid should never be given a patient to use herself. Of course suppurative vaginitis arises without gonorrheal infection.

There are two manifestations of stubborn vaginitis which are fortunately rare; viz., that of children and that of old age, vaginitis senilis, or atrophy. Persistent suppurative vaginitis in little girls is generally traceable to gonorrheal infection. Though the tracing is not always definite, as all sexual histories are notoriously false, yet this decision in regard to suppurative vaginitis in a child, persistent for months, is morally certain. Strassman, of Berlin, claims that intestinal parasites are apt to wander into the vagina, producing suppurative vaginitis. My experience so far has not confirmed this diagnosis, but I consider it very probable, and three years ago I advocated the view (publishing it in the *Medical Age*) that the gonococcus wandered from the vagina into the rectum, producing stricture of the rectum. Plain water douches do not generally cure the child afflicted with vaginitis. I am inclined, if it continues for months (and I have seen it persist for two years), to put the child to sleep, dilate the vagina, apply carbolic acid or bichlorid of mercury, and then continue the douches, medicated with tannin Na H $CO_3$ or Na Cl. If suppurative vaginitis in a child continues long, it seriously affects the health, causing anemia, neurosis, and constipation, with deranged digestion. The vaginitis senilis, or atrophy, must be attacked with a strongly medicated deuche, or perhaps better, a rather con-

centrated solution of Hg Cl, or carbolic acid, applied on cotton, followed by a douche of plain water. But I especially recommend carbolic acid, even pure, to local points, for it produces an impenetrable albuminate layer of coagula, or a highly protective layer of slough, which will desquamate, and beneath which a new vaginal epithelial layer will arise, the douche of plain water meanwhile washing and keeping away irritative secretions, thus allowing physiological rest for healing. Zn $SO_4$ or Zn Cl are effectual medicaments in douches, one to two per cent. being used for the suppurative kind of vaginitis; but the use of these remedies should be at least definitely controlled by the physician. In small children it seems to me wise for the physician alone to use the douche, though a nurse might perhaps be properly instructed to do it.

Many medicaments that are commonly added to the water do not have any special therapeutic effect beyond the plain hot water douche, but the patient is sometimes thus induced to be persistent in the use of the douche. Boracic acid 3ii to the quart, is frequently used, but adds little to the efficacy of the water. Some use a dram of permanganate to the gallon, others 3i of acetic acid; but the effect of these is not much beyond that of hot water.

I have almost entirely abandoned the use of the hard pessaries, but frequently there comes to the clinic (seldom to my office) a patient wearing a ring or other kind of pessary. The damage done to the vagina by the pessary is frequently extensive. A deep gutter will be found to exist all around the vagina, worn or ulcerated out by months of irritation. In these cases the removal of the pessary and a plain, hot douche, morning and evening, will soon allow the wound to heal.

A form of vaginitis sometimes exists toward the latter part of pregnancy which appears like specific granular vaginitis, but on closer inspection it may be observed that the granular appearance is not so red as the specific kind. The papillæ and all the mucous membrane of the vagina are swollen, enlarged, edematous, and, all in all, the condition can scarcely be distinguished from the granular specific vaginitis. But it is a frequent accompaniment of pregnancy, and will not generally pass away until after delivery; *i. e.*, until subinvolution occurs. It is due to excessive blood in the parts, and also to stasis from pressure; also, a careful examination may disclose the fact that the excoriating secretions come from the cervix and endometrium. Strassman mentions this form of colpitis. A large, hot, plain douche, twice daily, is the safest and most effective measure in these cases.

In ectropion, granular cervicitis, gaping os, and erosions, the large, plain, hot douche does well; it contracts the tissues, checks secretion, and relieves pain. Winkel recommends formalin in the proportion of 1 to 10,000; *i. e.* about a 3i of a ten per cent. solution (or a 3i of the commercial formula, which is a forty per cent. solution) of formalin to a quart. I have never employed this remedy, and hence cannot discuss its value. Sometimes we meet cases which we diagnose as a peculiar sluggish form of endometritis. The mucus projects out of the os like tough jelly, semisolid, and can be drawn out into long strings. In such a case the Na H $CO_3$ added to the douche is the most effective as an antiseptic remedy; alum or tannin are harmful in such cases, as the vagina is already dry, and such severe applications would only make the vagina more rough, raw, and dry. There is one thing which must not be forgotten in the cases which show simply leucorrhea, and that is the fact that the general health should be raised to as high a degree as possible. The improvement of the general health, especially in young girls with "green sickness," improves the catarrhal trouble.

It requires good judgment in the various forms of gonorrheal inflammation to know just how and when to employ the douche. The distinct forms of gonorrheal inflammation are, (1) vulvitis and vaginitis; (2) endometritis; the second being simply a continuation of the first. The accessible vagina with all its apparent diseases is a favorable field for the application of a douche, and I am inclined to think that the danger of inducing the gonococcus to ascend, which is sometimes used as an argument against the douche in gonorrhea, is overcome by the vast numbers of specific microbes it washes away. Hence I order the vaginal douche in all forms of specific vaginitis. Perhaps the best medicaments for a

douche in gonorrheal inflammation is Ag No. 3, say three per cent. to five per cent., or a good cleansing of the vagina with cotton and a twenty per cent. solution of Ag No. 3, followed with water. Some employ plumbic acetes (astringent). However, I must assert that it appears to me that, as far as medicine is concerned, we are absolutely unable to cure gonorrhea. Those who get well have extra resisting power, or else the virulent condition of the gonococcus was at a low ebb. I wish to remark here that hot douches too frequently repeated are injurious because they induce congestions and decongestion; *i. e.*, a disturbed circulation, which leads to an excessive amount of blood in the pelvic organs. The cause of pain after frequent douching is that an excess of blood has been induced to go to the tubes, and the congestion has called up tubal peristalsis, or tubal colic. Thus in gonorrheal infection a douche taken once or twice daily is amply sufficient. The organs should be allowed quiet, so that the infection will not ascend. At certain stages of gonorrheal tubal trouble (chronic) I think that douching is harmful, and that by omitting all douches the patient improves faster.

A general observation I will make here, and that is that women generally object to remedies which stain the undercloth-ing, since such discoloration naturally calls attention to delicate matters. Hence such remedies as permanganate, ichthyol, plumbum, acetes, or silver nitrate, should be avoided as far as possible.

An article went the rounds of the medical journals some eighteen months ago, I think, from the pen of Dr. Taylor, a woman physician of New York, which presented, in a vigorous form, the neurosis produced by the vaginal douche. Dr. Taylor delineated in detail how douches made women nervous; and all in all, the article almost completely disposed of the vaginal douche. The author of the paper seemed to have had a large experience in using the douche, which lent aid to her advocacy of dropping it, on account of its effect as a nerve irritator. But I also have made use of the douche in my practise for fifteen years, and must add my testimony, that it is the most universally useful therapeutic agent in gynecological practise. Doubtless some of the neurosis observed by Dr. Taylor following the vaginal douche was coincident, some accidental, and some from real causes. It is not strange that a sick woman may be nervous while using the douche; that is coincident, and to be expected. Her nerves are unbalanced before she begins the douche; and besides, the disease itself often gets worse while she is treating herself; that is incidental. She may also become accidentally worse, and hence more nervous. She may suffer a new invasion of the same or some other disease, especially at the monthly rhythm, particularly in the wide range of that disease known as gonorrhea. Gonorrhea, like the poor, is ever with us; and, like them, it is subject to innumerable vicissitudes and changes, recurrences and disasters. While there may be some cases which are made more nervous by the douche, it is because they are not properly instructed as to its use. Some begin too abruptly, using either too much water or too high a temperature, or they use the treatment too frequently, or perhaps do not rest a sufficient time after using it. But I must say that a vaginal douche, judiciously begun, and carefully and systematically carried out as to time, age, quantity, heat, medicament, attitude, and pathological condition, I have never known to produce neurosis.

A vaginal douche is a stimulant, it invigorates the pelvic organs, drives more blood to the nerve centers, and balances the circulation by means of the sympathetic nerves. Strassman wrote an excellent article in the *Theraputische Monatshefte* (December, 1895) on "Ausspülungen in der Gynakol, Behandlung," to which the reader may refer.

## MECHANICAL EXERCISE.

BY J. H. KELLOGG, M. D.

INVENTIVE genius has devised a considerable number of appliances by means of which a more or less perfect imitation of the action of the hands in the application of massage may be obtained. Zander, of Stockholm, and Taylor, of New York, as well as the writer, have invented machines for this purpose. For nearly twenty years the writer has made use of various forms of apparatus designed to administer mechanical massage, or what

[1] From a new work by the editor, "The Art of Massage," published by the Modern Medicine Pub. Co., Battle Creek, Mich.

is more commonly termed mechanical Swedish movements, with most excellent results in appropriate cases.

Mechanical massage may be advantageously used as a substitute for a number of the procedures of manual massage. I have, however, found no device quite equal to the human hand, for the administration of kneading movements. Shaking and vibratory movements, on the other hand, may be applied more efficiently by apparatus than by hand, in cases requiring vigorous and prolonged application, for the reason that much more vigorous, rapid, and uniform movements can be executed by machinery than by the hand, and the movement may be continued as long as necessary; whereas these movements are exceedingly trying to the masseur, and cannot be maintained, at best, for more than a few minutes continuously.

Several other procedures may be given by mechanical appliances quite as well as by the hand, and with even greater efficiency. The following is a brief description of the apparatus and modes of application which the writer has had in use in the Battle Creek Sanitarium during the last fifteen or twenty years, and which have stood the test of practical use in some thousands of cases, not as an exclusive mode of treatment, but as an auxiliary means employed in connection with manual massage, exercise, hydrotherapy, electricity, and other rational methods.

The meager knowledge which has heretofore existed in regard to the functions of the sympathetic nerve and its relation to the activities of the viscera, has rendered difficult an explanation of the remarkable therapeutic results which have been constantly witnessed from the employment of mechanical massage, especially in the treatment of hepatic and digestive disorders. Now that the functions of the great sympathetic nerve and of the abdominal ganglia and solar plexus are coming to be better understood, it is very clear that the application of strong vibratory or shaking movements to the abdomen may produce powerful physiological and therapeutic effects through the stimulation of the sympathetic. When it is recollected that the great abdominal brain controls the nutrition of the entire body through its influence upon the circulation and its universal control of glandular action, it must be clearly seen that therapeutic applications capable of affecting this portion of the nervous system cannot be made without marked results.

The observations of the late eminent Professor Charcot have called the attention of the profession to the powerful physiological and therapeutic effects of vibration in the treatment of organic disease of the spine, one of the most intractable classes of maladies. The confidence in mechanical massage as a therapeutic measure inspired by the great prestige of this renowned Parisian physician, has encouraged the writer to give publicity to some of the observations which he has made upon the subject during the last twenty years, and to describe some of the various means employed by him. Among the several devices made use of are a number which were invented by Zander and Taylor, who have also been working in this line; but the majority of those which the writer considers the most effective are the outgrowth of his own personal experience, and have been constructed after designs furnished by him. Several devices other than those described have been made and utilized, and have been found not without merit, but are not described here for lack of space.

*Mechanical Vibration.*— One of the most useful of all the several forms of mechanical massage is mechanical vibration. The highest rate of movement which can be attained by the hand is ten to twelve to and-fro movements per second; whereas, by the use of mechanical, electrical, or acoustic devices, effective vibratory movements may be produced at any rate desired between forty and fifty per second to ten times that number. Vibratory movements forcibly communicated to the body at the rate of six per minute, have been shown to produce at first a distinct muscular contraction with each oscillation; but if the vibration is long continued, the individual contractions become gradually less distinct, and after a time merge one into another, so that the contractions become continuous, or tetanic. From this fact it is apparent that mechanical vibration is capable of producing very decided physiological results as a mode of exercise; and that it exercises a powerful influence upon the circulation is a frequent observation. My patients constantly report

FIG. 1.—VIBRATING CHAIR.

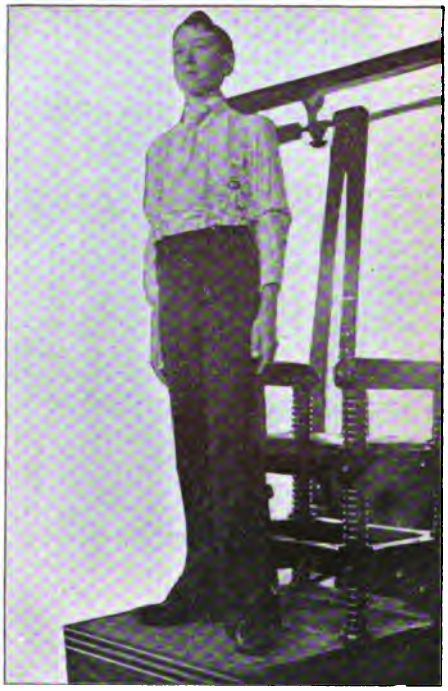


FIG. 2.—VIBRATING PLATFORM.

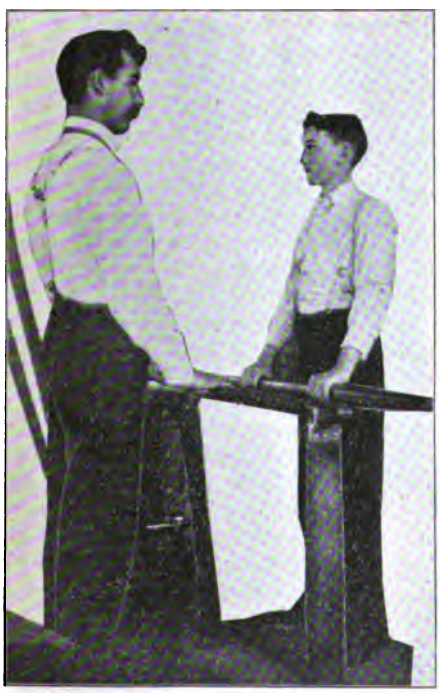


FIG. 3.—VIBRATING BAR.

FIG. 4.-- ENDWISE AND LATERAL VIBRATION OF THE FEET AND LEGS.

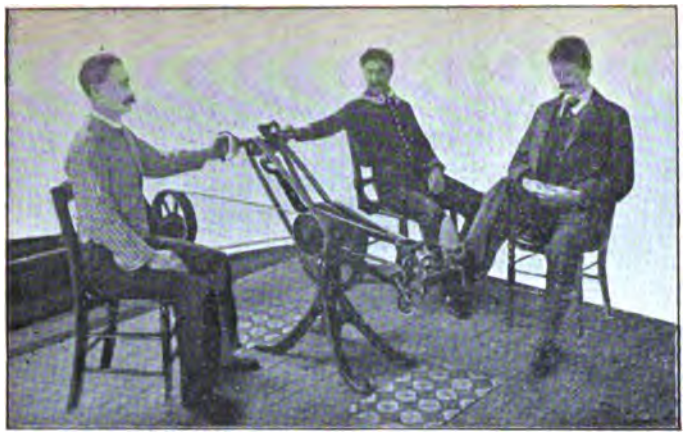


FIG. 5.—ROTARY VIBRATION OF THE LEGS AND ARMS.

FIG. 6.—VIBRATION OF THE TRUNK.

FIG. 7.—NERVE PERCUTER.

FIG. 8.—APPARATUS FOR KNEADING THE ABDOMEN

that vibratory movements make them warm, and restore the balance of the circulation when disturbed by morbid reflex action, so that, while the feet are warmed, the head is cooled.

Carefully conducted experiments which I have made, show that the temperature of a part subjected to mechanical vibration is actually increased, the amount of the increase depending upon the length of the application, and the degree of depression below the normal temperature at the start.

Vibration is also one of the most efficient means with which the writer is acquainted for relieving the great variety of paresthesias from which neurasthenic patients suffer, such as numbness, formication, tingling, etc.

*The Vibrating Chair.*— Figs. 1 and 2 represent the vibrating chair devised by the writer in 1883, and since in constant use at the Battle Creek Sanitarium. The usual rate of vibration employed is twenty per second. A person needs to experience but a single application to become convinced of the powerful physiological effects which may be produced by mechanical vibration. When seated in the chair, strong vibratory movements are experienced, in which the whole body takes part. The greatest amount of force is applied to the lower portion of the trunk. The vibratory impulses communicated are felt powerfully in the lower bowel, and have a decidedly stimulating effect upon the rectum.

By placing the hands upon the arms of the chair, and inclining the trunk either forward or backward, the impulses may be transmitted more or less forcibly, as desired, from the lower to the upper portions of the spinal column. The application should continue from three to ten minutes, to secure decided physiological effects.

*Vibrating Platform.*— In standing erect upon the moving platform on which the chair rests, the muscles of the legs are brought into powerful action. Not only the muscles of the lower leg, but the muscles of the thigh, are thrown into tetanic contraction by the strong vibratory movements transmitted through the legs (Fig. 2). The application usually lasts about five minutes. A separate platform may also be used.

□ *The Vibrating Bar.* — Fig. 3 is a very imperfect representation of an apparatus constructed for the writer several years ago, in which a suitable mechanism drives a pair of horizontal bars at a high rate of speed. In using the vibrating bar, the hands are first placed upon it with the fingers spread and held rigid, but with the wrists flexible. This throws the hands into violent vibration without communicating the vibratory impulses to any other portion of the body. The bar is then seized by the hands, which grasp it tightly while the arm is partly flexed at the elbow, the shoulder-joint being relaxed. Then, straightening the arms and holding them rigid, the muscles of the shoulders being fixed and the bar held firmly, the vibratory movements may be communicated to the upper spine and head with very great vigor, producing a powerfully stimulating effect upon the upper spine.

The vibratory impulses may also be communicated to the stomach, liver, loins, sacrum, rectum, and other parts, by bringing these portions of the body into direct contact with the bar.

Powerful endwise vibratory movements are given to the legs by placing the patient in a chair facing the apparatus, with the feet against the uprights which support the end of the bar opposite the driving mechanism. The vibratory movements obtained from this apparatus are applied to each part from half a minute to one minute.

*Vibration of the Arms and Legs.* — The legs are vibrated in three ways: (1) By means of an endwise movement; (2) by means of a lateral movement; (3) by means of a rotary movement. The effects of these three modes of vibration are similar, yet in some respects different. The time of application is usually from three to five minutes.

Endwise vibration is by far the most vigorous of the three modes. It is administered by means of a horizontal vibrating bar against the end of which the feet are placed, supported in suitable rests (Fig. 4).

Lateral vibration is administered by means of the same apparatus, the feet being placed against the side of the bar instead of the end (Fig. 4).

Rotary vibration is produced by means of a rotating bar against the end of which the feet are supported (Fig. 5). The leg is held straight, not flexed, as in the cut. The same apparatus is used for the arms.

*Vibration of the Trunk.*— In Fig. 6 is

shown a method of applying vigorous vibratory movements to the trunk. The apparatus consists of a mechanism by means of which a strong horizontal bar is made to oscillate at the rate of 1200 to 1500 times per minute. By means of suitable padded rests placed upon the bar, vibratory movements may be communicated to the back, the abdomen, or to either side, as may be desired. The special purpose of this apparatus is to communicate mechanical motion to the liver, stomach, bowels, and other abdominal viscera. It is a vigorous means of stimulating peristaltic activity, and of quickening the circulation in the large viscera of the abdomen. This apparatus the writer has had in use at the Battle Creek Sanitarium for twenty years, and has found it an exceedingly effective device. It is not simply a means of amusing the patient, but is capable of producing powerful physiological and therapeutic effects. The time of application to each part is usually from three to five minutes.

*Nerve Percuter, or Vibrator.*— This instrument, which I have recently had constructed, consists of a metalic chamber in which a mass of soft iron is made to play to and fro with considerable force by means of an alternating electrical current passing through a coil of wire which constitutes a part of the chamber. The blows struck by the oscillating mass of iron are communicated to the portion of the body under treatment by a brass rod terminating in a knob. By means of this simple device, very vigorous vibratory movements may be applied to the head, to a nerve trunk, or to any part of the body to which it is desirable to make vibratory applications (Fig. 7).

*Mechanical Kneading.*— By means of suitable apparatus, mechanical kneading may be applied in a very efficient manner to the bowels, the arms, the legs, and even to the whole trunk.

Mechanical kneading of the abdomen is one of the most useful of the several forms of kneading; it may perhaps with justice be said to be the most useful of all. It is best administered by means of the apparatus shown in the cut (Fig. 8). The writer had this apparatus specially constructed for the purpose some twelve years ago, and has had it in constant use since.

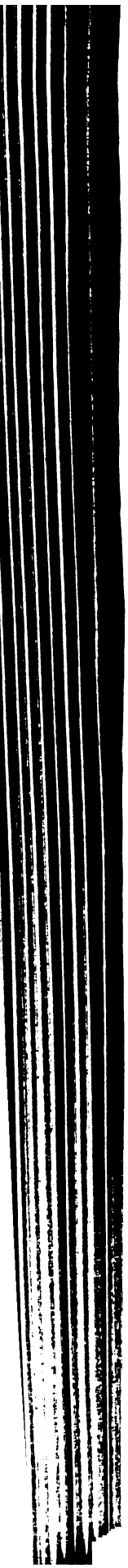
The apparatus consists of a table with a large aperture near the center of its top. In this opening plays a series of six vertically placed bars, each surmounted by a suitable pad. Each bar is separately actuated by a cam, or eccentric, so that it has its own independent motion. These six eccentrics are so arranged as to give a wave-like form to the combined movement of the six kneading pads. Simultaneously with the vertical movement of this kneading device, the table top, with the patient which it bears, is made to move back and forth, thus changing the relation of the pads to the abdominal surface, and causing them to knead the entire abdomen. The two sets of movements are so timed that the wave-like kneading movement is made to follow very closely the course of the colon, thus bringing this part of the intestine especially under control. Zander has a similar machine.

I have found this apparatus of very great service in the treatment of constipation. It is not, of course, a panacea for this disease, which arises from many different causes; but it is a most efficient auxiliary to other measures, and not a few cases have been observed in which the patient traced the greater part of the benefit received from a systematic course of treatment to this apparatus alone.

Mechanical kneading of the abdomen is useful not only in constipation, but also in cases of dilatation of the stomach in which there is, as a result of the dilatation, a considerable degree of motor insufficiency, in consequence of which the stomach does not empty itself with normal promptness. This treatment is of value in all cases of slow digestion so-called, and should be used an hour or two after each meal. The kneading is usually continued from five to fifteen minutes.

(To be continued.)

**Intra-Uterine Injection in Uterine Inertia.** — A Scotch veterinary surgeon more than fifty years ago brought forward the practise of introducing into the uterus five or six quarts of tepid water in cases of uterine inertia in cows. The same means has been employed successfully in similar cases with women. If accompanied by aseptic precautions, this method would seem to be free from objections, and likely to succeed.



## OFFICIAL REPORT OF THE MARRIAGES, BIRTHS, DEATHS, AND CAUSE OF DEATH FOR FEBRUARY, 1896, IN JALISCO, MEXICO.

CLASSIFIED according to sex, age, and disease: —

| BIRTHS. | | DEATHS. | |
|---|---|---|---|
| Male | 119 | Male | 112 |
| Female | 124 | Female | 124 |
| Total | 243 | Total | 236 |

Marriages..... 75

Classification of deaths according to age and sex: —

| | Male. | Female. |
|---|---|---|
| From 1 to 5 years | 58 | 50 |
| " 6 to 10 " | 1 | 3 |
| " 11 to 20 " | 1 | 7 |
| " 21 to 30 " | 11 | 9 |
| " 31 to 40 " | 9 | 9 |
| " 41 to 50 " | 9 | 9 |
| " 61 to 70 " | 3 | 9 |
| " 71 and over | 1 | 11 |
| Totals | 112 | 124 |

Classification of deaths according to disease: —

| | | | |
|---|---|---|---|
| Epilepsy, | 3 | Biliousness, | 2 |
| Alcoholism, | 1 | Erysipelas, | 3 |
| Quinsy, | 2 | Hemorrhage, | 2 |
| Cerebral affections, | 12 | Dropsy, | 1 |
| From childbirth, | 16 | Wounds, | 3 |
| Aneurism, | 4 | Inflammations, | 2 |
| Anemia, | 1 | Intermittent fever, | 2 |
| Bronchitis, | 4 | Pneumonia, | 18 |
| Consumption, | 1 | Peritonitis, | 1 |
| Cancer, | 2 | Sting of scorpion | 1 |
| Colic, | 6 | Phthisis, | 1 |
| Croup, | 2 | Whooping-cough, | 3 |
| Diarrhea, | 36 | Tumor, | 2 |
| Dysentery, | 1 | Tuberculosis, | 2 |
| Inflammation of bowels, | 14 | Typhaid fever, | 4 |
| | | Miscellaneous, | 15 |

The above is taken from *El Estado de Jalisco*, the official journal of the state of Jalisco. In all probability the cases of consumption and tuberculosis were foreigners, as it does not seem to be a disease which develops in Guadalajara. It will be noticed that diseases of the bowels are the most fatal, while pneumonia is next.

**Typhoid Fever.**— An interesting report has recently been published commenting upon the partial disappearance of typhoid fever among the soldiers of the French army. Ten years ago, fourteen in every thousand of the regular troops were attacked with the disease. Upon the introduction of an uncontaminated water supply where possible, and the use of Pasteur filters elsewhere, these numbers were reduced to six in every thousand. The French military authorities predict a still further decrease in the next decade.

**Sanitary Climatology.**— We are glad to note the valuable work which is being done by Mark W. Harrington, Chief of the National Weather Bureau. The statistics which are being gathered by Professor Harrington will, when a sufficient amount of data has been accumulated, furnish a basis for most important deductions. We are glad to note that a publication containing collected and compiled facts is ta be issued each month.

**The Pineal Gland.**— Descartes declared that the pineal gland was the seat of the soul, but recent researches indicate that it simply represents a mass of nerve matter which, in lizards and other reptiles, is connected with a third eye, called the pineal eye, and which is of no use because covered with an opaque skin. In past ages there may have been animals in which this third eye was sufficiently developed to be of service.

A case has recently been reported in which a child was born with three eyes, the third eye being in the center of the forehead, and sufficiently developed to be easily recognizable as an imperfectly formed eye.

**An Interesting Case of Bone Grafting.**— Mr. Waterhouse, a London surgeon, recently reported a case in which the entire heel-bone was removed on account of a tuberculous disease, there being left only a thin shell of compact tissue. A new heel-bone was constructed from the shoulder-bone of a lamb which had been served for dinner in the hospital. The bone was steeped in carbolic acid, washed in ether, and sterilized in a solution of carbolic acid, cut into chips, and made with a paste of iodoform ; then carefully packed into the cavity, the skin closed over it, and an antiseptic dressing applied. At the end of two weeks the wound was entirely healed, and the patient provided with a new heel.

# TRANSLATIONS AND ABSTRACTS

[THE articles in this department are prepared expressly for this journal.]

## INTESTINAL FERMENTATIONS.

AT a meeting of the section on General Medicine of the New York Academy of Medicine, held May 19, 1896, intestinal fermentation was made a subject of the evening's papers and discussions. We quote the following abstract of proceedings from the *American Medico-Surgical Bulletin*:—

"Professor R. H. Chittenden, of Yale College, opened the discussion. He said that he could hardly do more than call attention to the processes involved, and some of the products formed. Bacteria constituted the great factor in intestinal fermentation, and their amount depended much upon the nature of the environments, whether or not they were suitable to their development and multiplication. In a general way, the proteid food, especially in soluble form, was the best for their existence and growth, though they also lived in carbohydrates. The reaction of the intestinal contents was also important, most forms existing best in alkaline medium, though some could thrive in a neutral, and a few in an acid, medium. The intestinal tract, therefore, seemed to meet the conditions favorable for their existence and development. The intestinal tract also offered the greatest variety of conditions for the bacteria, especially at its beginning, by the conditions arising from the entrance of the bile, the pancreatic secretions, the contents of the stomach, etc. Added to these conditions, the amount of bacteria present was also affected by the normal or abnormal amount of peristalsis, the quantity and quality of food.

"Professor Chittenden spoke of the great variety of bacteria in the intestinal tract, and said that it was quite evident that many of the ingested bacteria were killed or their growth stopped by the germicidal action of the gastric secretion, especially the acid. The fact that the stomach contained but comparatively few bacteria might be taken as indicating that a great many were destroyed by its secretions. It was easily seen, therefore, that those that passed were influenced by the condition of the stomach at the time of their ingestion, and that under normal conditions the bacteria came wholly from without.

"Professor Chittenden cited a case in which a guinea-pig had been taken from the mother by Cesarean section, never being allowed to breathe other than sterilized air or take other than sterilized food, and it thrived much better than its brothers and sisters that lived under the ordinary conditions, thus indicating that bacteria were not absolutely necessary for the digestive changes in the alimentary tract, but even possibly harmful at all times. The bacilli lactis aërogenes existed in greatest quantity in the small intestine, while the bacillus coli communis prevailed in the large intestine. Pyogenic cocci existed in large quantities in the intestines, and bacteria might be found in the feces, though some claimed they were in a weakened condition.

"Professor Chittenden spoke at length of the products resulting from the metabolic processes of bacterial life, and the effects of these products upon the system, and said while there was much that was not known concerning these products, yet enough was known to enable us to understand something of their influences in producing a great class of nervous symptoms as well as pathological conditions. Not only the direct products of fermentation, due to the bacterial life, were capable of producing untoward effects upon the system, but it was a question if these products by synthesis were not able to form even more toxic products. There could be hardly any doubt that in minor disturbances many of them depended upon absorption of the products of excessive intestinal fermentation. This was indicated by the febrile disturbances that often follow disturbance of intestinal peristalsis, etc.

"Professor Chittenden discussed at length the means by which excessive intestinal indigestion could be arrested. The main indication was doubtless the regulation of diet, though for a long time mercurials had been extensively used, and now other antiseptics were also much employed. He was inclined to lay much stress upon the dietary. Milk was an important form of food for the diminution of excessive fermentation. It was a question if milk did not have the power of resisting certain forms of fermentation

and aiding others. Upon a milk diet, the bacteria in the feces were diminished, and a diet of sterilized milk decreased them still more. Moreover, the milk acted upon the entire alimentary tract, favoring antiseptic conditions, not by any antiseptic action of its own, though there remained a nuclein which might possibly have some germicidal action. It was also possible that the formation of lactic acid checked the growth of bacteria when a milk diet was used.

"THE BACTERIOLOGY OF THE STOMACH, AND PRACTICAL THERAPEUTICS. — Dr. J. H. Kellogg, of Battle Creek, Mich., read a paper with this title, and said that much attention had been given during the last dozen years to the chemistry of digestion, but that little had been done in the way of the study of the bacteria of the stomach in relation to therapeutics. He had made a careful comparative bacteriological and chemical study of the stomach fluid in 377 cases, and presented some of the conclusions in this paper.

"The mode of examination used and the information sought were, (1) the number of microbes per cubic centimeter contained in the stomach fluid; (2) the presence or absence of gelatin-liquefying bacteria; (3) the presence or absence of gas-producing bacteria; (4) the presence or absence of acid-forming bacteria; (5) the toxicity of the products of bacterial activity in the stomach fluids.

"In the 377 examinations made, the stomach fluid had been taken from more than 350 persons, and of these fluids, 191 were found to be absolutely sterile, while 67 contained less than 50 bacteria to the cubic centimeter, a number so small that it might be looked upon as accidental, and these fluids also classed as sterile. On the other hand, 102 specimens contained bacteria, from 100 to more than 2,000,000 per cubic centimeter.

"He was not surprised to find large numbers of bacteria, but was a good deal surprised to find such a large number of perfectly sterile specimens of stomach fluids, considering the fact that Caedec and Bournay had recently stated that the stomach and intestinal fluids were not destructive of micro-organisms, as was formerly supposed, and likewise the assertion commonly made by bacteriologists and physiologists that bacteria were not only present in the alimentary tract, but were useful in the digestive process.

"The fact that no bacteria at all were found in 50.8 per cent. of the 377 stomach fluids examined at the end of one hour of digestion, seemed evidence enough to demonstrate the proposition that the normal stomach was able to destroy the microbes which accidentally entered it through the mouth or nose, and that microbes played no part in normal digestion. In further confirmation of this view, Dr. Kellogg quoted Kurhoff and Wagner.

"His method of examination was based mainly upon that of Hayem and Winter.

"In comparing the results of bacteriological examination with the results of chemical examination, he had noted very carefully the relation of bacteria to (1) the calculated acidity which represented the combined value of free hydrochloric acid and the combined chlorin diminished by the fatty acids present; (2) the acidity; (3) the free hydrochloric acid; (4) the combined chlorin; (5) the coefficient of starch digestion; (6) the coefficient of salivary secretion; (7) the coefficient of chlorin liberation; (8) the coefficient of absorption.

"The summary of this comparison was as follows: Of the 191 cases that were sterile, 80 were hypopeptic, and in 28 the amount of chlorin eliminated was normal. There were then 83 cases of hyperpepsia, and in 55 of these, combined chlorin was in excess and free hydrochloric acid normal or in excess; in 12 cases free hydrochloric acid was deficient, and in one it was absent. Combined chlorin was deficient or less than 1.55 milligrams per 100 c.c. in 16 of the cases. Hydrochloric acid was deficient in 68 of the 80 cases of hypopepsia, and normal or in excess in 12. It appeared, therefore, that a sterile condition of the stomach fluid might exist in hypopepsia as well as in hyperpepsia, for 42 per cent. of the sterile cases were cases of hypopepsia, whereas hyperpepsia was found in only 43 per cent. of the cases. In 48 per cent. of the cases in which bacteria were absent, free hydrochloric acid was less than normal in quantity, being below 25 milligrams per 100 c.c. of stomach fluid, and in 23.5 per cent. it was absent altogether.

"The fact was noticed that the anaërobic germs were found most abundant in

cases where the total acidity, the free hydrochloric acid, the coefficient of liberation, and the coefficient of absorption were the lowest; and it appeared that the anaërobics flourished better in an acid medium, or rather resisted the influence of hydrochloric acid, better than the aërobics did.

"The coefficient of absorption in the anaërobic infected cases was .38, as compared with .34 in the sterile cases.

"Dr. Kellogg then discussed the method of the relation of the urinary toxicity to the bacteria in the alimentary canal. The normal urotoxic coefficient was .46, but in the case of a lady suffering from a severe attack of migraine, with the stomach infected to a high degree, the urotoxic coefficient was found to be six times the normal. In another case of marked infection, a young lady suffering from epilepsy, the urotoxic coefficient, as she was recovering from a series of seizures, was found to be double the normal. He said it was possible to cite numerous similar cases. His studies, he thought, had established one fact of considerable importance; *i. e.*, that the fermentation test heretofore relied upon was of but little value, and that bacteriological examination was the only means by which it was possible to determine accurately the presence or absence of gastric infection.

"Dr. Kellogg, in discussing the treatment of cases of gastric infection, said that he found a dry diet had the best effect, generally speaking. Nuts were quite good, if well disintegrated, and hydrotherapy and systematic exercise had a beneficial effect.

"For patients with dilated stomachs or flaccid gastric walls he found the pad, made on the principle of a truss, of great comfort and service.

"Dr. W. H. Porter said the papers read were very instructive and interesting. He thought that from a practical standpoint the etiology resolved itself into three elements or conditions: The ingestion of material not adapted to digestive and nutritive purposes; resulting from this a system poorly nourished; and finally, digestive fermentation, with great numbers of bacteria. Diet, therefore, was the primary cause, and hence its regulation was the main factor in treating such cases. He thought a well-regulated mixed diet often gave the best results, but in more aggravated cases milk or buttermilk proved of the greatest benefit. The milk diet furnished sufficient nutrition, and did not furnish the culture media for bacteria that a promiscuous diet did. Especially could this be said of buttermilk. Some of the so-called antiseptics were quite extensively used, and rapid and brilliant results were frequently reported.

"Dr. H. D. Chapin said he thought the subject under discussion was of very great importance, inasmuch as all wasting diseases, as phthisis, etc., were seriously affected by the condition of the alimentary tract. He, too, thought that the dietary was of the greatest importance; and though patients often insisted that they could not take milk, for instance, yet when made to take it slowly and alone, they found that they could take it, and thrived upon it. In some cases a diet of hot water and rare beef proved beneficial. Many of the cases of children suffering from indigestion, especially in the summer-time, could not take milk; and hot water alone, or egg-water, often proved sufficient to restore the normal condition. He thought that little effect could be produced by the use of intestinal antiseptics, unless the medication was pushed to such an extent as to disturb the system; nevertheless, he had to confess that he had obtained some of his best results with large doses of subnitrate of bismuth.

"Dr. H. Power said that for the past five years he had been trying to determine the relation between intestinal fermentation and convulsive seizures. To this end, in his clinical work, he had been treating epileptics by combining intestinal antiseptics with the bromides, and carefully watching the results. He had used the different antiseptics, but found that the continued use of most of them disturbed the system, a combination of borax and boracic acid being the least disturbing. He had turned his attention to treating these cases by dietary, regulating the bowels, etc., and had been able to control epileptic cases without the use of bromides.

"Dr. Wm. H. Thomson said that for a number of years he had been accustomed to advocate that there was a fundamental difference between organic and functional nervous diseases, and that no organic nervous disease could be intermittent in its symptoms. No person,

however astute, was able to tell that a member of his audience, for instance, would in a few minutes be in an epileptic fit, or that a brilliant and vivacious lady would the next day be prostrated with an attack of migraine. The remotest pathological basis for either could not be discovered, and no clinical proof was present. He had argued that these conditions were, in all probability, due to the action of poisons. Poison might circulate in the body for months, and yet not until a certain hour did it reach that condition where its explosive effect was manifest. Was it not natural to infer that the functional nervous diseases were more likely due to toxins than to molecular nerve changes? He had treated epilepsy for years as a toxic disorder, and had employed gastro-intestinal antiseptics. The diet, however, was of primary importance, and, recognizing the relation of meat to convulsions, he had excluded butchers' meat from the dietary. For years he had been accustomed to treat migraine with intestinal antiseptics, and he was glad to hear Dr. Kellogg indicate that he thought it was largely due to toxins.

"In 1893 he had read before the Pathological Society a paper on Graves's disease, in which he had taken the ground that the name 'exophthalmic goiter' was a misnomer, for the disease often existed without the exophthalmos or the goiter. He had also taken the view that it was not a disease due to the disturbance of the sympathetic system, but that it was a toxemia. His attention had been turned to the subject by the case of a lady who suffered from the disease, and was cured by being put upon matzoon. She afterward returned to a meat diet, and the disease returned, but again disappeared upon her returning to the matzoon. The question naturally arose, What relation did digestion bear to the cause of the disease, if by the use of proper diet we could reduce an enlarged thyroid gland, quiet a rapid heart, and restore the general health? His conclusion had been that the disease was due to intestinal fermentation, and that the ptomains paralyzed the vasomotor system. Since 1893 he had treated 19 cases of Graves's disease, and now had no more fear of it than of malaria treated with quinine. The thyroid gland, he thought, was doing all it could to neutralize the ptomains; and its excision, in the hope of curing the disease, was no more to be considered than the excision of the kidney for the cure of diabetes mellitus.

"Dr. Thompson said that he considered bismuth *the* intestinal antiseptic; and in the treatment of typhoid fever he always used 80, sometimes 120, grn. per day. For a long time his favorite remedy for the treatment of chronic gastritis had been resorcin in solution. For gastric ulcer, which he found to be a very common condition, he used $\frac{1}{20}$ gr. of bichromate of potash and 3 gr. of subcarbonate of bismuth before meals, and resorcin after.

"Dr. Kellogg said he had been impressed with the remarks upon diet. He thought too much faith had been placed in hydrochloric acid, and perhaps not enough in the mucous membrane of the stomach itself. He had been convinced that migraine was due to indigestion, and the immediate cause was a disturbance of the abdominal sympathetic. Deep pressure about two inches to either side of the umbilicus revealed a small spot of great tenderness if the patient had had an attack of migraine just previously. If both were tender, it indicated that the trouble was on both sides; if one side was tender, the trouble had been on that side.

"Professor Chittenden said it was the general idea that free hydrochloric acid was necessary for vigorous digestion, but that this was not necessarily so. The combined acid also had considerable germicidal action."

## RELATIVE VALUE OF MEATS AS FOOD.

R. H. CHITTENDEN, Ph. D., professor of physiological chemistry in Yale University, contributed to a recent number of the *Dietetic and Hygienic Gazette* an article upon the value of meats as food, from which we make the following extracts: —

"Regarding the use of meats as food there are some interesting facts that may be profitably considered. Thus it is stated that in Western Europe, among the easier classes, one fourth of their food consists of meat or fish, the other three fourths being made up of vegetables and fruits. In Great Britain the proportion of meat used is considerably larger."

"'Meat is a dear form of food. In

regard to proteid matter, lean beef contains, roughly speaking, twice as much as wheat flour, but beef is about four times as dear as flour, so that you may estimate that proteids of animal source are about twice as costly as proteids of vegetable source.'"

"The cheapest food is that which supplies the most nutriment for the least money. The well-known maxim that 'the best is the cheapest' is not true of foods; for the term 'best' in this connection is ordinarily applied to that which has the finest appearance, the finest flavor, the most tender structure, etc., and does not necessarily imply that it is the most nutritious, healthful, or economical."

"The high-priced tenderloin steak is simply a dietetic luxury; . . . not to be recommended on the ground that it is more nutritious. And yet many a hard-working man, with the laudable desire to provide himself and family with a good and nutritious dietary, spends his hard-earned money in a reckless and foolish manner through his ignorance of the fact that the food sold at the highest price is not generally the cheapest. He thinks he must emulate his richer neighbor, and that to economize by buying anything inferior in quality or cheaper in price would be a sacrifice of both dignity and principle. This point has been well discussed in a recent bulletin issued by the United States Department of Agriculture on the nutritive value and cost of foods.

"'No one,' boasts a coal laborer, whose case was cited by Mr. Meriwether in illustration of this very point, 'can say that I do not give my family the best of flour, the finest of sugar, the very best quality of meat.' He paid $156 a year for the nicest cuts of meat, which his wife had to cook before six in the morning or after half-past six at night, because she worked all day in a factory. When good butter was selling at twenty-five cents a pound, he paid twenty-nine cents for an extra quality. He spent only $108 a year for clothing for his family of nine, and only $72 a year for rent in a close tenement-house, where they slept in rooms without windows or closets. He indulged in this extravagance in food, when much less expensive food materials, such as regularly come upon the tables of men of wealth, would have been just as nutritious, just as wholesome, and in every way just as good, save in its gratification to pride and palate. He was committing an immense economic blunder, but, like thousands of others, he did so without understanding at all that it was a blunder.

"In conclusion, allow me to say that in my judgment meats occupy a somewhat peculiar place in our category of dietetic articles. A close examination of the dietetic customs of civilized peoples shows that two distinct objects are ever kept clearly in view; viz., the satisfying of the grosser needs of the body — the needs of general nutrition — and the satisfying the needs of the higher functions of the central nervous system. Now meats plainly share with vegetables, fruits, dairy products, etc., the ability to minister to the former wants of the body, but in addition, as already stated, they have certain stimulating properties which distinguish them from the grosser vegetable foods. In this respect they might perhaps almost be classed with such articles as tea, coffee, etc."

Professor Chittenden approves of the use of meat for the same reason that he approves of the use of such articles as "tea, coffee, etc.," the "etc." possibly including wine and other stimulants. Experience has clearly shown, however, that tea, coffee, and similar stimulants are not required for the healthy maintenance of any bodily function, and that they are especially damaging to the nervous system.

If the proteids of meats differ from the proteids of vegetables only in the fact that they are stimulating as well as nutritious, resembling tea and coffee in stimulating properties, this would seem to be rather an article against their use than in favor of it. It is safe to predict that in the near future far greater attention will be given to nuts and other seeds rich in proteid matters, and that nuts and legumes of various kinds will be much more used as foods, than at the present time.

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**Serum Treatment of Puerperal Fever.**—Dr. Marmorek has demonstrated that puerperal fever may be successfully combated by means of aseptic serum. The serum treatment of puerperal fever will not, of course, be expected to be a substitute for curetting and the employment of other means necessary for the removal of the causes of the sepsis.

# BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE AND BACTERIOLOGICAL REVIEW, from original sources.]

**Blastomycetes Found in Sarcomata.**— In five sarcomata taken from different parts and different tissues, parasitic forms, analogous to those described by several observers in cases of adenocarcinoma, were studied by Roucali.

These parasites react to specific staining reagents, and resist the action of acids and alkalies in the very same way as the blastomycetes found in adenocarcinoma. They may be intracellular, extracellular, and even intranuclear; they multiply by budding; in the young state they may be seen without membrane and with abundant chromatic protoplasm; they may be homogeneous or partly granular or degenerate; that is, wanting in protoplasm or furnished with protoplasm so modified as to lose all property of staining with aniline dye.

**Vitality of the Typhoid Bacillus.**— Uffelmann affirms that the typhoid bacillus retains its vitality in a dry state for twenty-one days; in street sweepings, thirty days or more; in sand, for thirty-two days; on wood, thirty-two days; and on linen, more than two months. In a moist medium it is probable that microbes retain their power of growth for a still longer time. Uffellmann also proves that typhoid bacilli may be transmitted by the air as well as by clothing. He distinguishes the typhoid bacillus by its characteristic growth upon methyl-violet, gelatin, and by the fact that it does not induce fermentation in a two per cent. lactose gelatin.

**Microbe of Scurvy.**—Teste and Beri (*Gaz. degli Osped.*) have isolated from a fragment of tissue taken from the gum of a scorbutic patient, a micro-organism which they believe to be the cause of scurvy. The microbe is round, stains in all the aniline dyes, but resists Gram's stain. Its cultures liquefy gelatin, and give rise to a sawdust-like deposit. Guinea-pigs and rabbits inoculated with these cultures have a rise of temperature, and the microscopy shows hemorrhagic stains in various parts of the body, and nodules of connective tissue, new formation. The above results were obtained in three out of four experiments. In the fourth, the authors attribute the negative results to the fact that the patient had improved considerably under treatment.

**Microbic Origin of Rickets.**— Micróli (*Gaz. Med. di Torino*) believes that this disease is caused by the effect of ordinary pyogenic organisms upon the osseous and nervous system. Clinically he finds support for this theory in the fact that rickets develops independently of social conditions. It frequently begins with eczema, boils, or intestinal catarrh; occasionally occurs epidermically, and is accompanied with fever, polyarthritic and bone pains, hydrocephalus, marasmus, and paresis of lower extremities. Pyogenic organisms have been found in the bones and central nervous system of rickety children. Experimental injections of pyogens into the bones and epiphysical cartilages of young rabbits produced in some cases common osteomyelitis, but in other cases an osteomyelitis without traces of suppuration, with hypertrophy of cartilages analogous to that of rickets and marasmus.

**Methylene Blue in Malaria.**—Röttger, of Kiel, reports in *Deutsche Medwoche* for 1896, seven cases of malarial fever treated by means of methylene blue in one and one-half grain doses in capsules, repeated six or eight times daily.

The effect of the remedy seems to have been very striking. The duration of the treatment is from eight to thirty-three days. The febrile effects were the first to disappear, the plasmodia disappearing later. The patient was considered cured when the plasmodia and the splenic enlargement had both disappeared. No new effects were noticed upon the intra-intestinal tract or the genito-urinary system.

When used for a long time, however, methylene blue has an unfavorable effect upon the general health. During the administration of the drug, the urine is green or dark-colored, and the stools are green, but colored only upon the surface. The author concludes that methylene blue is, next to quinine, the most effective of all drugs in cases of malaria.

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## THE RATIONAL TREATMENT OF FEVERS.

AT a recent meeting of the American Medical Association, William Osler, professor of medicine in the Johns Hopkins University, gave the annual address on general medicine, choosing for his subject, "The Study of the Fevers of the South." Dr. Osler, in his address, spoke of the empiricisms which prevail in the treatment of typhoid and other fevers, and called special attention to the fact that "advances in the treatment of fevers, and especially of typhoid, have not kept pace with the rapid progress in our knowledge of their etiology. In the present condition of bacteriology we may hopefully expect great things in the near future; but meanwhile we jog along without any fixed aim, too often carried away by winds of doctrines and wild theories. Still it is something to have escaped from the restless activities of our grandfathers. They were not all, however, of the same stamp. If I had typhoid fever, and had a theosophic option as to a family physician, I would choose Nathan Smith, nor would I care whether it was while he labored in the little town of Cornish, N. H., in 1798, or after he had become the distinguished professor of medicine in Yale."

Dr. Osler is a strong advocate of the cold bath in typhoid fever, and contrasts this method, combined with good nursing, with the method in vogue at the beginning of the present century, in the following paragraphs: —

"I know of no more graphic contrast than can be drawn between the comfort of fever patients at the beginning and at the close of the century. In illustration, let me give you an account which I picked up last summer in the medical library at Boston, from a brochure by Dr. Gamage on the fever of 1817–18 in that city. He was describing a typical case of typhoid fever with several relapses, which occurred in a woman, whom he saw about the first of February. In the first attack, between February 3 and 28, she had seventeen bleedings, varying from fifteen to twenty ounces; in all, 167 ounces of blood were taken. She had active purgation and calomel galore. There were blisters to the neck, blisters behind the ears, blisters on the abdomen. Throughout March, April, and May the patient had three, if not four, relapses, in each of which there were renewed bleedings, though the amount of blood was rarely more than four to six ounces. The purging and blistering was kept up, but there were added on several occasions cold ablutions, and thrice she had tepid baths. In the very full record which he gives of the case it is evident that scarcely forty-eight hours passed without some active medication.

"Think of the misery, the tediousness, the discomfort of a typhoid case with three relapses; think of the bleedings, the blisterings, the purgings, from which at least our fever patients of to-day are free! Contrast the quiet, the care, the gentle nursing, the scrupulous cleanliness, the abundance of cold water to drink, and the fresh air which typhoid patients of to-day receive. A practitioner of the Nathan Smith type, a man who has the confidence of his patients, will carry through a majority of his typhoid fever patients without a single dose of medicine, not a purge, not a vomit, not even a fever mixture. He is a patient, anxious spectator of a process he cannot arrest, a watchful guardian who will know when

to act with promptitude and decision, and when to refrain. Would that worthy successors of this good old man (whose article on the typhus fever of New England shows him to have been a true disciple of Sydenham) were more numerous. Some of us insist, and I am one of them, that in hospital practise a cold bath every three hours, when the fever arises above a certain point, saves from eight to ten in each hundred cases; while there are others — *quot homines, tot sententiæ* — who put their trust in purges, or who undertake to disinfect the twenty feet of bowel with drugs whose chief virtue is their harmlessness.

"Old Dr. Gamage, whose case I read to you, with that delightful complacency which has not yet disappeared from our ranks, congratulated himself and his patient that success had crowned his efforts."

The so-called "Woodbridge treatment," which has been considerably discussed during the past year or two, was made the subject of an hour's discussion during this meeting. Dr. Osler doubtless had this method (if it can be called a method) in mind in writing the following paragraphs, in the sentiments of which we fully concur: —

"I must claim the privilege of a faddist to abuse roundly other faddists who do not swim in my puddle. As a strong advocate of hydrotherapy, I take especial pleasure in denouncing as heretics of the worst possible stamp, the advocates of the so-called antiseptic and abortive methods of treatment of typhoid fever. I would place the man who does not for this purpose also give a purge, in a limbo just a little less hot, as he probably does a little less harm. It galls my kibe, too, to think that the heresy is spreading, and scarcely a week passes in which I do not receive a temperature chart of some case of typhoid fever which has terminated spontaneously on the twelfth or fourteenth day, as a triumphant demonstration of the value of drugs, which from my point of view might as well have been given *per cutem* in the tub. At present I am so wholly abandoned to cold water practises that I confess to be anything but an impartial critic. Still, intestinal antisepsis is not a matter for typhoid fever patients only; and now that the glamour with which Bouchard invested the subject is fading, we are getting to hard common-sense views on the question. Two facts — the two grains of wheat in the two bushels of chaff — which you can winnow from the whole complex literature to date about antiseptic medication, are: First, that in such a disease as cholera, in which the germs thrive and grow directly in the bowel, it is a failure; and second, the impossibility of destroying experimentally germs in the bowel by any antiseptic administered *per os* in harmless doses.

"The advocates in this country for the abortive and antiseptic plan of treatment must bring forward a much stronger body of evidence than has been presented, and in a much more rational way, before they can hope to carry conviction to the skeptic. Indeed, more than this, they must not regard themselves as exempt from the common rules which are recognized everywhere in modern medicine as essential. . . .

"To assert an abortive treatment of typhoid in a case in which on the thirteenth day of the illness, and on the seventh of the treatment, a patient died of intussusception, 'cured of his typhoid fever on the seventh day of treatment,' so it is stated, when the autopsy showed 'the characteristic and extensive ulceration of Peyer's patches and tumefied glands,' is to talk a language unintelligible to an educated medical man, and is nothing short of midsummer madness. . . .

"Another piece of evidence is mentioned in a case in which the disease was so far aborted as to enable the patient to sit up and eat beefsteak on the tenth day.

He remained well for fifteen days, and then, *mirabile dictu*, this aborted fever had the audacity to relapse."

Dr. Osler's whole address was a vigorous and earnest protest against the empirical use of drugs in the practise of medicine, as well as a plea for the employment of physiological remedies, and made a profound impression upon the association. His address was the subject of more comment and remark than any other paper read.

## THE TRUTH ABOUT CONCENTRATED FOODS.

No end of mischief is attributable to the erroneous popular notion respecting concentrated foods. The laity, however, are not at fault, as they have been improperly instructed and imposed upon, often even by medical men, or at least men with quasi-medical endorsement. Liebig's Beef Extract, for example, has long displayed upon the label surrounding each small package something like the following: "The contents of this package [usually less than a pound] represent the nutrient value of forty pounds of best beef." Doubtless there are hundreds, perhaps thousands of persons, feeble fever patients, invalids, and others really requiring nourishment of a positive value, but easily assimilable, who have been starved to death by means of Liebig's Extract and similar preparations of beef and other meats. Liebig himself highly valued the extract which has so long been known by his name, but he stated, with reference to the tea made from it, that it must not be considered as a food, but rather as a stimulant, to be placed with such other nerve-stimulants as tea and coffee.

Certain manufacturers of so-called "health foods," and other advertising firms have long imposed upon the public by mixtures of various sorts claiming to represent the concentrated value of large quantities of food. The actual nutritive value of any substance certainly cannot be greater than the total of the solid materials which it contains. Some of these so-called nutrient foods consist almost wholly of water or alcoholic mixtures of various sorts, their solid ingredients constituting not more than one twentieth of their actual bulk. The late Claude Bernard and other investigators, by experiments upon animals, have shown that these so-called "extracts" have very little nutritive value. A dog fed on meat extracts by Claude Bernard died a day or two sooner than a dog which had had nothing but water, showing that meat extracts are really wholly without nutritive value, at least when taken without the admixture of other food substances. They are, in fact, as shown by the late Austin Flint, stimulating rather than nourishing in character, a fact, as before stated, pointed out by Liebig, the famous chemist, who first proposed their use.

The following humorous account of the "explosion of little Gustavus Adolphus," which recently appeared in *Truth*, is a very apt exposure of the popular fallacy in relation to these so-called "concentrated foods:"—

"The smiling family were gathered round the hospitable board. The table was plenteously laid with a soup plate in front of each beaming child, a bucket of hot water before the radiant mother, and at the head of the board the Christmas dinner of the happy home, warmly covered by a thimble, and resting on a poker chip. The expectant whispers of the little ones were hushed as the father, rising from his chair, lifted the thimble and disclosed a small pill of concentrated nourishment on the chip before him. Christmas turkey, cranberry sauce, plum pudding, mince pie—it was all there, all jammed into that little pill, and only waiting to expand. Then the father, with deep reverence, and a devout eye alternating between the pill and heaven, lifted his voice in a benediction. At this mo-

ment there was an agonized cry from the mother. 'O Henry, quick; baby has snatched the pill!' It was too true. Dear little Gustavus Adolphus, the golden-haired baby boy, had grabbed the whole Christmas dinner off the poker chip, and bolted it. Three hundred and fifty pounds of concentrated nourishment passed down the esophagus of the unthinking child. 'Clap him on the back,' cried the distracted mother. 'Give him water!' The idea was fatal. The water, striking the pill, caused it to expand. There was a dull rumbling sound, and then, with an awful bang, Gustavus Adolphus exploded into fragments. And when they gathered the little corpse together, the baby lips were parted in a lingering smile that could be worn only by a child who had eaten thirteen Christmas dinners."

## THERAPEUTICS OF ANEMIA.

W. H. PORTER (*American Surgical Bulletin*, November, 1895) says that anemiacs may be divided into three groups, as follows: —

1. Those who take too little food.

2. Those in whom the iron naturally found in the food is fixed by sulphur compounds taken with the foods or generated in the intestine, and so prevented from entering the circulation.

3. Those in whom the tissue processes of the body are disturbed so that the nucleo-albumin of the food is not properly utilized in the system, a condition found in all infectious diseases, and when the ptomains and toxins of microbic origin are introduced into the body. This condition is also present in the uric acid diathesis, in oxaluria, and in neurasthenia, rheumatism, diabetes, and other systemic conditions connected with lithemia.

The author recommends as remedies for these several conditions, the following: —

1. An ample supply of nourishing and easily digestible food, and especial attention to out-of-door exercise.

2. Careful attention to diet and the improvement of digestion by the administration of chlorid of iron, the object being to furnish more iron than the sulphur present can combine with, thus leaving the iron of the food for assimilation. Other iron compounds may be used if chlorid of iron disagrees.

3. Attention to diet and digestion, as in the preceding classes, carefully avoiding, however, the inorganic salts of iron, which are likely to injure the digestive organs if in a weakened state.

Dr. Porter seems to give insufficient attention to the improvement of digestion and the suppression of the formation of sulphur compounds in the alimentary canal. Meinert, of Dresden, has shown that anemia is very commonly associated with dilatation of the stomach and prolapse of the bowels, conditions which favor the development of microbes in the alimentary canal and the formation of toxic substances. It is certainly clear that much attention should be given to the suppression of vicious fermentations in the stomach and intestines. When sulphur compounds are formed in excess, ptomains and toxins of various sorts are developed at the same time; so that in the anemia which accompanies chronic dyspepsia, we generally find in operation, as causes of the condition, not only a fixation of the iron by sulphur developed in the alimentary canal, but general toxemia, the result of the formation of ptomains and toxins in the alimentary canal, and their absorption into the circulation.

For the suppression of these vicious fermentations, massage of the stomach, massage of the colon, the use of charcoal, and especially an aseptic dietary are of the first importance. Meats of all kinds so readily give rise to putrefactive processes in the intestines, especially when the digestive organs are weak, or any stoppage of the food exists as a result of dilatation of the stomach or prolapse of

the bowels, that they must be discarded in cases of anemia of this class, if Dr. Porter's reasoning is correct; and certainly his conclusions are confirmed by the observations of Meinert and Glenard. In many cases, eggs must be interdicted for the same reason. In certain forms they often give rise to putrefaction in the stomach, as indicated by foul eructations, and the vomiting of highly offensive matters.

A dietary consisting chiefly of fruits, nuts, and farinaceous preparations, or, in extreme cases, a diet of kumyss or buttermilk, the writer has found most useful in combating anemia resulting from indigestion. Bromose, a preparation from nuts,—practically, malted nuts,—has also proved particularly effective, as the proteids present are in a state of such fine subdivision as to be readily digested and assimilated; the starch is converted into maltose; while the fat, which is present in considerable quantity, is carefully emulsified.

**Angina Pectoris from Gastric Disorder.**— The writer has met a number of cases in which all the symptoms of angina pectoris were present to a very marked degree, but which were evidently not due to organic changes in the heart, for the reason that they soon disappeared upon the correction of associated digestive disorders. In most cases there was found dilatation of the stomach, with fermentation and the production of a considerable quantity of gas. Within a few hours after eating there was extreme sensitiveness of the lumbo-abdominal sympathetic and of the solar plexus.

Dr. Grouzdew, a few months ago, reported in the *Medical Week* several cases of angina pectoris due to dyspeptic disorders. In one case there was no arteriosclerosis, but constipation and marked indigestion existed. Eight other cases were observed. Dr. Grouzdew observed that relief in these cases was almost immediately obtained by washing out the stomach with a stomach-tube. In cases noted by the writer, relief has been obtained in the same way.

**Morning Diarrhea.** — Some months ago Dr. Delafield called attention in the *Medical Record* to a class of cases in which loose movements of the bowels occur in the early morning, frequently attended by extreme exhaustion. He prescribed for this condition, change of climate, especially a dry climate remote from the seacoast; occasional lavage of the stomach, with careful dietary; arsenic, quinine, ipecac, and especially castor-oil, the last-named remedy being considered the best of all.

These cases are not at all mysterious, and are quite easily managed when considered in the light of modern bacteriology. Morning diarrhea we believe to be due simply to the development of bacteria and the production of toxins by them in the colon, producing irritation and an outflow of serum, which is intended by the system as a protective means. We have had no difficulty in curing cases of this sort by placing the patient under a strictly aseptic dietary, withholding meats, fish, shell-fish, and in some cases eggs, and placing the patient upon a buttermilk, kumyss, or kumyzoon dietary, with fruits and farinaceous foods. Granose and bromose have proved to be excellent preparations in these cases. In addition, the colon must be disinfected daily by a coloclyster, followed by a solution of tannin, a dram to the pint of water. The tannin and gallic acid are advantageous in these cases, not because of their astringent properties, but because they are fairly good germicides, and are non-toxic.

**The Infectious Nature of Cancer.** — A considerable amount of work has of late years been done in the attempt to prove that cancers are produced by some form of parasite, and that they are thus

infectious. While much of this has been without result, the attention of keen observers is being fixed upon small round bodies, many times smaller than a red blood corpuscle, which are found, sometimes inside, sometimes outside, the cells. It yet remains to be proved that these little bodies are in any way connected with the causation of cancer, nevertheless a step has been taken in the right direction. Clinical evidence is certainly accumulating to show that cancers are infective. With the present improved methods of research, we may look for the solution of this and many kindred problems.

**The Value of Vaccination.**— It is a fact worthy of note that while the mortality among children in Great Britain from such diseases as scarlet fever, measles, whooping-cough, etc., remains practically the same as it was fifty years ago, despite improved sanitation and better protective laws for the poor, that from smallpox has decreased over 70 per cent. In those crowded districts of the large cities where vaccination laws are rigidly enforced, smallpox among children has been almost entirely eradicated.

During the Washington epidemic of 1892, only 1.3 per cent. of those who took the disease, having been previously vaccinated, died. Contrast this with the fact that 21.4 per cent. of unvaccinated sufferers succumbed to the disease. What better illustration of the value of this preventive measure could be asked or given?

A LATE English medical journal reports that Mr. Waterhouse has recently succeeded in constructing a new heel-bone from the *collar*-bone of a sheep! This is certainly a most astonishing achievement, as it includes not only the constructing of the heel-bone for the man, but a collar-bone for the sheep also. Our English cousins, with their superior advantages for medical learning, ought certainly to know that the sheep has no collar-bone.

**Is Tuberculosis Transmitted by Milk?** — From an extended series of thoroughly scientific experiments, we learn that milk from cows with tuberculous udders is of an extremely virulent nature. Further, buttermilk, cream, and butter derived from such milk, all contain tubercular matter actively injurious to man. Since we can, as a rule, know nothing of the condition of the cows from which we obtain our milk, it must be evident that all dairy milk should be boiled before being placed upon our table.

**Spices and Hemorrhoids.**— It has long been known that the free use of spices and condiments — mustard, pepper, pepper-sauce, capsicum, etc. — is productive of hemorrhoids and other forms of rectal disease. A striking confirmation of this theory is found in the experience of the Dutch custom-house officers of Java, who are required to carefully examine, by tasting, the spices and other products passing through their hands, in order that the government may be sure that the high commercial standard of their exports is maintained. The inspector knows very well that spices are injurious, and consequently takes the precaution to eject from his mouth as much as possible of the sample tasted. Nevertheless, a portion is dissolved by the saliva, and finds its way into the stomach, as the result of which the official, after a certain length of service, almost invariably becomes afflicted with the most aggravated form of hemorrhoids. Prolapse of the rectum follows, sometimes so extensive as to expose several inches of intestine. On withdrawal from service, the official, in time, recovers, only to return, however, and repeat the experience. The difference between the Javanese inspector and the American who suffers from hemorrhoids, is that the former is paid a salary for his suffering, while the latter pays for the privilege of having an inflamed, ulcerated, or prolapsed rectum.

**Against Antipyretics.** — The medical profession, both in this country and Europe, is becoming convinced that antipyretics, although capable of reducing temperature, fail to afford the patient the advantages which have been expected of them. They lower the temperature, not by aiding in the elimination of the toxic agent, of the presence of which the high temperature is an indication, but by overwhelming the effects of one toxic agent with those of another acting in the opposite direction. The patient is thus drawn between the upper and nether millstones, so to speak. It is indeed a very proper question, whether the body is any better able to resist the action of two poisons than one. It has been clearly shown that both the temperature-elevating and the temperature-lowering poisons depress the heart, and Charrin's experiments have shown that antipyretics have a pernicious effect upon the tissues, and that they lessen the resistance of the body.

# REVIEWS.

REPORT OF FIFTY CASES OF ABDOMINAL SECTION.— By William J. Gillette, M. D., Toledo, O.

Dr. Gillette gives, in this brief paper, a carefully tabulated record of fifty-one cases of abdominal section. The patients all recovered but four, which is a most excellent record, showing the author to be a competent abdominal surgeon, who knows how to command the conditions essential to best results.

LECTURES ON APPENDICITIS, AND NOTES ON OTHER SUBJECTS.— By Robert T. Morris, A. M., M. D., New York. G. P. Putnam's Sons.

This work of something more than 160 pages, beautifully printed on calendered paper, and profusely illustrated with original half-tones, includes the substance of the distinguished author's teachings on appendicitis at the Post-Graduate Medical School in New York City. These lectures will be recognized as one of the most lucid and interesting presentations of the subject of appendicitis which has yet appeared. The notes on various topics are fully as interesting as the lectures, and show to excellent advantage the practical character of the author's mind. Some of his best work is represented in the conservative surgery of the arm. He has succeeded in making a useful new arm in cases which would be almost universally pronounced hopeless, even by skilled surgeons. The volume is, altogether, an exceedingly interesting one, which does credit to both author and publishers.

SLEEP AND ITS RELATION TO DISEASES OF THE SKIN.— By L. Duncan Bulkley, A. M., M. D.

In this little paper, Dr. Bulkley arranges the causes of disturbances of sleep under six main classes, as follows: 1. Digestive; 2. Toxic: 3. Circulatory; 4. Nervous; 5. Psychic; 6. Cutaneous.

The author well says, in relation to the use of hypnotics: "Routine prescribing may occasionally give relief, but far oftener it does harm. A vast weight of responsibility rests on those who, in times past or present, have vaunted this or that new soporific." This paper is very terse and practical, and should benefit, in more ways than one, every physician whom it reaches.

SCIENTIFIC BULLETIN, No. 2.— This *Bulletin*, issued under the direction of Dr. Herman M. Biggs, New York, presents to the profession, matter of a highly practical and valuable character. The present number contains papers on "The Sanitary Supervision of Tuberculosis as Practised in New York City;" "The Study of a Bacillus Resembling the Bacillus of Diphtheria Found in Milk and American Cheese;" "Some Investigations as to the Possible Agency of Writing Utensils in the Spread of Diphtheria in Public Schools," etc.,— all interesting and practical papers worked out in a thoroughly scientific way. The author of the paper last mentioned shows very clearly that pencils and other writing utensils may become the vehicle of disease, thus communicating diphtheria and other infectious maladies from an infected to a healthy child, through association in the schoolroom.

MEDICAL AND SURGICAL REPORT OF THE CHILDREN'S HOSPITAL IN BOSTON, MASS.— Edited by T. M. Rotch, M. D., and Herbert L. Burrell, M. D.

This is a handsome volume of nearly four hundred pages, profusely illustrated with fine half-tone engravings, printed on beautiful paper, and filled with most practical information respecting the disorders of children, especially those grave and chronic ailments which are most satisfactorily treated in a well-equipped hospital. The details of the management of such disorders as caries of the vertebræ, hip-joint disease, and similar affections, are carefully presented, and rendered still clearer by the numerous excellent illustrations accompanying the text. A table of cases operated upon for empyema gives the details of forty-two cases, with only three deaths, which is certainly a splendid showing for the extensive surgical work done in this model institution, a picture of which forms the frontispiece of the book.

## The Battle Creek Sanitarium
# LABORATORY OF HYGIENE.

J. H. KELLOGG, M. D., Superintendent.
GEO. W. BURLEIGH, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
A. B. OLSEN, B. S., M. D., Pathologist.
W. A. GEORGE, M. D., Chemist.

**Monthly Resumé of Work Done.**

## REPORT OF EXAMINATION OF BLOOD.

FOR MAY.

| Blood Count. | Men. | Women. | Total. |
|---|---|---|---|
| Over 5,000,000 | 10 | 1 | 11 |
| Between 4,500,000 and 5,000,000 | 63 | 3 | 68 |
| " 4,000,000 " 4,500,000 | 15 | 44 | 59 |
| " 3,500,000 " 4,000,000 | 1 | 10 | 11 |
| " 3,000,000 " 3,500,000 | 1 | | 1 |
| Totals | 92 | 58 | 150 |

| Hemoglobin. | Men. | Women. | Total. |
|---|---|---|---|
| 100 per cent. | 27 | 5 | 32 |
| 93 " " | 49 | 39 | 88 |
| 86 " " | 11 | 13 | 24 |
| 78 " " | 1 | | 1 |
| 71 " " | 1 | 2 | 3 |
| Totals | 89 | 59 | 148 |

**Report of Gastric Laboratory for May.**— Chemical analysis was made of 166 stomach fluids. The number of patients from each State was as follows: Michigan, 61; Illinois, 22; Ohio, 18; Wisconsin, 6; Washington, 4; New York, 4; Texas, 7; Kentucky, 4; Nebraska, 3; Indiana, 6; Missouri, 4; North Dakota, 3; South Dakota, 3; California, 2; Kansas, 2; Iowa, 2; Vermont, 1; New Mexico, 1; Colorado, 1; Connecticut, 1; Pennsylvania, 1; Tennessee, 1; Mississippi, 1; Oklahoma, 1. Number of cases, 159.

**Microscopical Examination of Sputum for May.**— Number of specimens examined, 60; number of cases, 50; number of cases in which tubercle bacilli were found, 11.

The patients were from the following States: Michigan, 2; Iowa, 1; New York, 2; Ohio, 1; Tennessee, 1; Illinois, 2; Wisconsin, 1; Minnesota, 1. Total, 11.

**Report of Urinary Laboratory for May.**— Number of specimens, 418; number of cases, 245. Number of cases with pus, 76; albumin, 20; blood, 9; casts, 7; sugar, 7; bile, 4. Number of cases tested for toxicity, 7.


# The Stomach: Its Disorders and How to Cure Them.

By J. H. KELLOGG, M. D.,

Superintendent of the Battle Creek (Mich.) Sanitarium, Member of the British and American Associations for the Advancement of Science, the American Microscopical Society, the Society of Hygiene of France, Author of the Home Hand-Book of Domestic Hygiene and Rational Medicine, Etc.

A BRIEF, practical treatise on the most common of human ailments, in which the causes and cure of the functional disorders of digestion are dealt with in a clear and practical manner.

**The Following are Leading Chapter Headings:**

**The Organs of Digestion,**
**Foods,**
**The Digestive Fluids,**
**General View of the Digestive Process,**
**The Maladies of the Modern Stomach,**
**Important and New Discoveries Relating to Digestion,**
**The Symptoms of Dyspepsia,**
**The Systematic Treatment of Indigestion,**
**Treatment of Dyspepsia,**
**Remedies for the Home Treatment of Dyspepsia,**
**Quacks and Nostrums.**

The work is illustrated with more than one hundred and thirty cuts, including eleven full-page plates, three colored plates, etc.

This work ought to be in the hands of every dyspeptic.

**MODERN MEDICINE PUBLISHING COMPANY.**

# PUBLISHERS' DEPARTMENT.

## SPECIAL REGULATIONS FOR THE SECOND PAN-AMERICAN MEDICAL CONGRESS, TO MEET IN THE CITY OF MEXICO ON THE 16TH, 17TH, 18TH, AND 19TH OF NOVEMBER, 1896.

### ENROLLMENT.

Article 1. In order to be properly enrolled, each member of the Congress will pay to the Treasurer thereof in the City of Mexico, the sum of five dollars in gold.

### GENERAL SESSIONS.

Art. 2. There will be one opening session, one closing, and one intermediate session of a purely scientific character.

Art. 3. The opening session, which will be of a formal character, and presided over by the supreme authority of the nation, besides being attended by the members of the Congress, will also be attended by the members of scientific societies, and other distinguished persons who may be invited. The session will be opened with the report of the General Secretary.

This will be followed by a speech of welcome, pronounced by the President of the Congress.

Two members will then speak on scientific subjects, and they will be followed by a speech from the President of the Republic. It is strongly recommended that the scientific speeches should be of short duration.

The intervals between the speeches will be filled up with musical performances.

Art. 4. At the closing session, the General Secretary will notify the place designated by the Congress for holding the third meeting.

Art. 5. The Treasurer will present his accounts to the Congress, showing the disbursements made of the funds entrusted to his care.

Art. 6. A scientific speech will be delivered and a short speech by one representative of each one of the nations attending the Congress.

Art. 7. In the intermediate session, four speeches will be delivered on general matters, by persons who are highly distinguished in medical science, and who, having been in due time invited to do so, have accepted the commission; one of these speeches being pronounced by a Mexican physician, who shall be invited to do so by the Committee of Management.

Art. 8. No discussions will be held in the General Sessions.

### SESSIONS OF THE SECTIONS.

Art. 9. These sessions will be held from 9 to 12 A. M. and from 3 to 5 P. M., in the places that may be designated by the Organizing Committee. They shall be presided over by the President of each section, alternating with the Vice-Presidents of each one of the nations that are represented in the respective sections.

Art. 10. The person who may be appointed by the Committee of Organization, will be the ex-officio Secretary of each section, and he will fill his post alternately with the Secretaries of the nations who may be represented in the sections; but should the latter not be present, their places will be supplied by the President in office.

Art. 11. The President will direct the discussion in accordance with the order of the day, and will decide all questions that may arise, and that may not be provided for in these regulations.

Art. 12. The ex-officio Secretary will make out the minutes, and for that purpose, besides his own notes, will collect those of the Secretaries who may have acted in the section. He will also collect from the persons who may have spoken, the written extracts referred to in Art. 19.

Art. 13. All questions relating to the debates which are not provided for in these Regulations, will be decided in accordance with general parliamentary practise.

Art. 14. The voting will be by name or by putting the question.

### PAPERS, EXTRACTS THEREOF, AND DISCUSSIONS IN THE SESSIONS OF THE SECTIONS.

Art. 15. All papers will be presented in writing.

Art. 16. Each author will forward to the Secretary of the Organizing Committee in the City of Mexico and before the first day of August of the present year, an extract not exceeding 300 words, of the paper to be presented by him. These extracts will be printed in English, French, and Spanish, and will be distributed to the members of the Congress, before the session in which they are to be read.

Art. 17. No paper will be announced which is not accompanied by this extract: but the authors who comply with these conditions, will have a right to have their work published intact in the transactions of the Congress.

Art. 18. The reading of the papers in the sessions must not last more than twenty minutes; when the papers are so long that they cannot be read within that time, the authors will give extracts from them, either in writing or by speech; but they will be published intact in the transactions of the Congress and in the language in which they have been written.

Art. 19. The extracts referred to in the preceding article will be delivered at the same time as the papers, to the Secretary of the section to which they pertain.

Art. 20. The members of the Congress who may take part in the discussions in any section, will present their speeches in writing at the termination of the sessions, to the respective Secretaries of such sections, and they will also be published in the transactions.

Art. 21. The papers which have been announced for reading in the order of the day in each section, will serve as subjects for discussion. In such discussions, no speaker will be allowed to speak more than once and for five minutes; but the author of the paper under discussion, will be allowed to reply, if he considers it necessary, in one sole speech, which shall not go beyond ten minutes.

### AUXILIARY COMMITTEES IN THE MEXICAN REPUBLIC.

Art. 22. These Committees will be appointed by the Committee of Organization, and will be composed of one member for each Local Medical Society, or in their absence, of one physician for every center of population. They will co-operate with the Committee of Organization in promoting the success of the Congress. Said Committees will be appointed during the first months of the present year.

### EXECUTIVE COMMITTEE.

Art. 23. In order to form this Committee, the Organizing Committee will appoint seven members, including the President, Secretary, Treasurer, and

the Mexican representative in the International Executive Committee, and such members will attend to everything relating to the business of the Congress, in accordance with the regulations that they may adopt for that purpose.

DR. RAFAEL LAVISTA.
DR. MANUEL CARMONAY VALLE.
DR. EDUARDO LICÉAGA.

*Mexico, January, 1896.*

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CHRONIC GASTRITIS OF LONG STANDING, WITH PERIODIC ATTACKS OF MIGRAINE.— The herewith reported case is one of double interest, inasmuch as the patient has been under my care for a number of years, and previous to the commencement of the present treatment, I had been unsuccessful in affording much relief or in preventing the recurrence of the frequent and periodic attacks of migraine, to which she had been more or less subject since early womanhood, the cause of which I could not account for otherwise than as "a habit long continued," aggravated by gastric catarrh.

The history of the case is briefly as follows: Mrs. A., aged fifty-five, since early womanhood has been subject to periodic attacks of migraine at intervals of two, three, or four weeks, but seldom free from them for longer intervals.

An attack comes on by general malaise of usually a day's duration, repugnance of food or drink, marked drowsiness, much depression, with request for rest and quiet, followed by complete physical prostration, dull frontal headache, which the least noise or disturbance makes the more intense, invariably accompanied by violent and frequent attacks of vomiting and retching, inability to retain any food or nourishment of any kind, retention of the feces, often cold sweats, pulse somewhat slow and weak and small in volume, this condition lasting usually two days, followed by gradual cessation of symptoms.

During the whole period of usually four or five days' duration, she is unable to take nourishment of any kind, remains constantly in bed, and desires only complete rest and quiet. The previous treatments have been so varied and on so many different plans, that I refrain from mentioning them.

Two years ago I was able to prevent an attack for over two months by the use of strychnin in 1-20 grain doses t. i. d., with careful diet and an artificial digestive.

In May, 1895, I put her on Charles Marchand's Glycozone in teaspoonful doses well diluted t. i. d., using this as all other previous remedies, experimentally; she commenced to improve much in general health, having an unusually good appetite, without the previous distressing symptoms following, a more regular movement of the bowels, freedom from headache, and in every way a decided improvement; this improvement and enjoyment of good health lasted during continuation of above treatment, for over three months. Unknown to me, she stopped taking the Glycozone, thinking herself perfectly well. In a few weeks she had a return attack, milder, and devoid of gastric distress. A similar attack occurred two months later, both of which took place some weeks after stopping the above described treatment, and caused, I might say, by imprudence in diet.

The conclusion come to in this case is that the headache is sympathetic; that the stomach becomes acutely inflamed by its inability to naturally and properly perform its functions, and respond to the call of nature to unload itself, and thus secure for a time rest; that the use of Glycozone has corrected the existing gastritis, and by so doing has removed the primary cause of these many years of suffering.— *Geo. A. Curriden, M. D., in Medical Summary.*

---

## THE MISSISSIPPI VALLEY MEDICAL ASSOCIATION.

A MEETING of the Executive Committee of the Mississippi Valley Medical Association was held at Atlanta, on May 6th, and the following gentlemen were appointed to deliver addresses: Dr. H. N. Moyer, Chicago, Address on Medicine: Dr. Horace H. Grant, Louisville, Address on Surgery.

The indications are that the meeting to be held at St. Paul, on October 20, 21, 22, and 23, will be the largest and most successful in the history of the Association. As all the railroads will offer reduced rates for the round trip, an opportunity will be given to visit St. Paul and Minnesota during the most delightful season of the year.

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THE following institutions are conducted under the same general management as the Sanitarium at Battle Creek, Mich., which has long been known as the most thoroughly equipped sanitary establishment in the United States. The same rational and physiological principles relative to the treatment of disease are recognized at these institutions as at the Battle Creek Sanitarium, and they are conducted on the same general plan. Both medical and surgical cases are received at all of them. Each one possesses special advantages due to locality or other characteristic features.

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## CHICAGO SANITARIUM,

28 COLLEGE PLACE, CHICAGO, ILL.

THIS institution is a branch of the Battle Creek (Mich.) Sanitarium. It is favorably located near Lake Michigan, in the southern portion of the city, close to Cottage Grove avenue, and facing the old Baptist University grounds. A few patients are accommodated. Facilities are afforded for hydrotherapy, and the application of massage, electricity, Swedish movements, and other rational measures of treatment.

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COLLEGE VIEW is a thriving village located in the suburbs of Lincoln, with which it is connected by an electric railway. College View is the seat of Union College, one of the leading educational institutions of the West. The Sanitarium has a beautiful location, facing the spacious college grounds, and gives its guests the advantages of a quiet, homelike place, combined with appropriate and thoroughly rational treatment. It has a full equipment of excellent nurses, and has already won for itself an enviable reputation in the West.

## PORTLAND SANITARIUM,

PORTLAND, ORE.

L. J. BELKNAP, M. D., Superintendent.

THIS institution is beautifully located in the center of the city, in a fine building with spacious grounds; and although it has been in operation scarcely more than a year, it already has a good patronage, and has evidently entered upon a successful career. Facilities are provided for the dietetic and medical treatment of chronic ailments of all kinds. The advantages for treatment include, in addition to various forms of hydrotherapy, electric-light baths, and apparatus for the application of electricity in its various useful forms, manual Swedish movements and massage.

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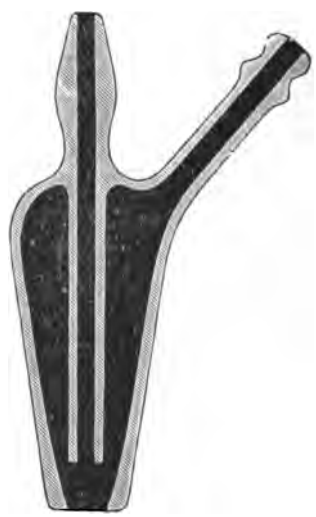

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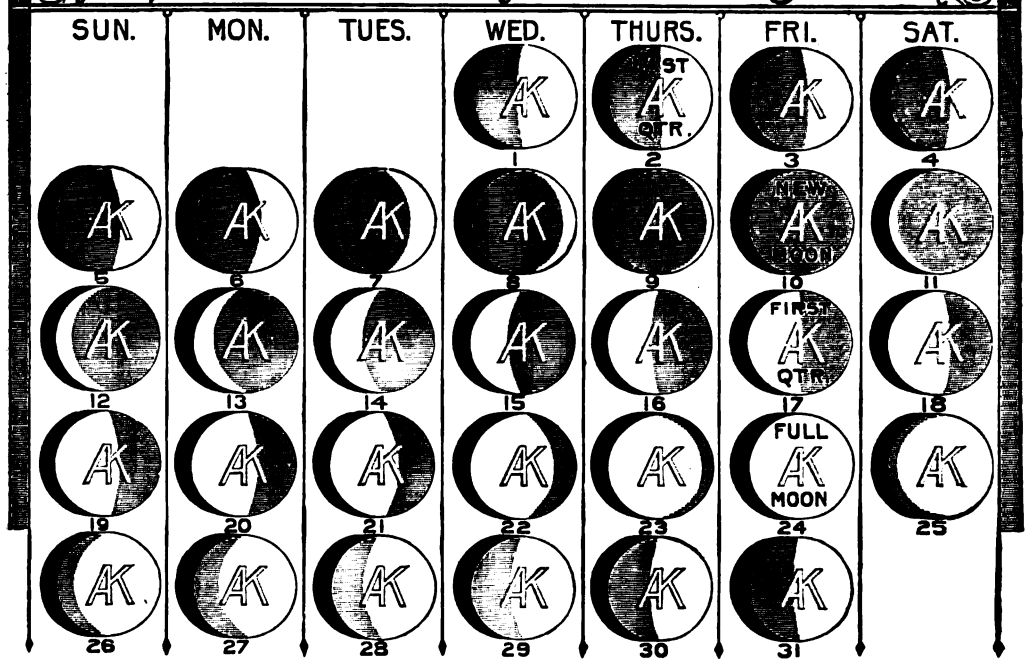


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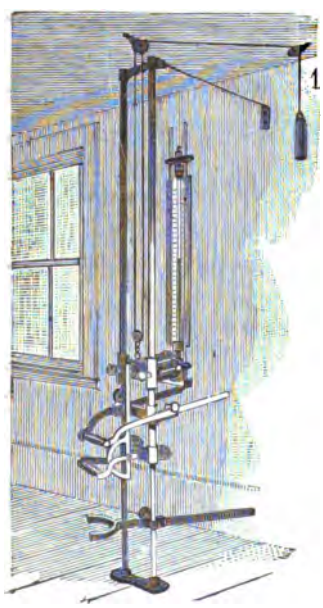

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Bulletin of the Sanitarium Hospital and Laboratory of Hygiene.
SANITARIUM, BATTLE CREEK, MICH.

Edited by J. H. Kellogg, M.D.

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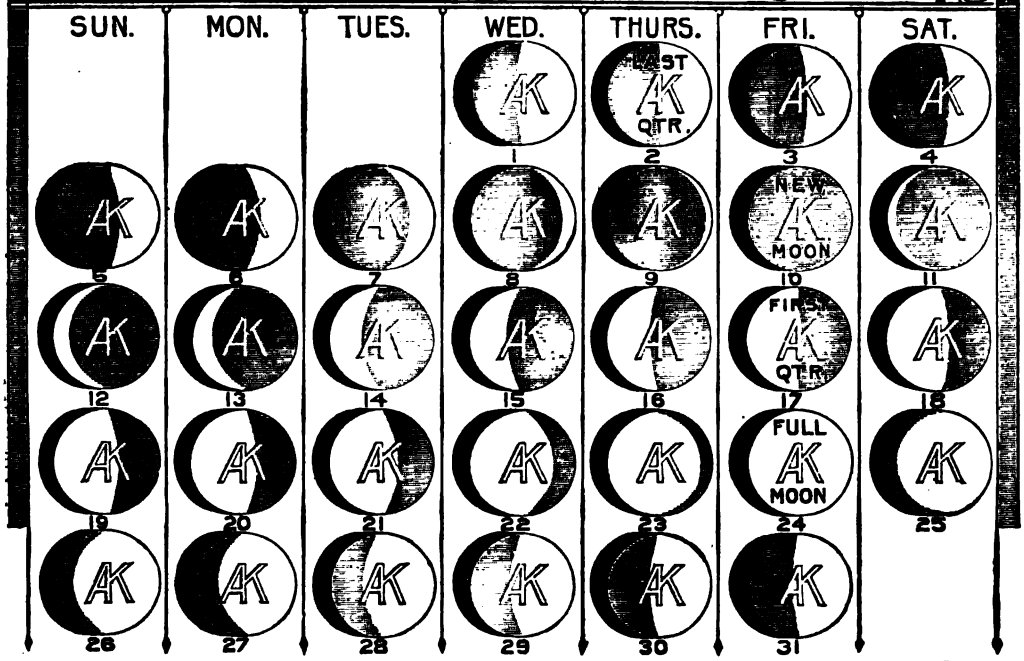


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| 10 Mail Ex. | 4 L'v'd Ex. | 6 Acc. Ex. | 42 Mixd Tr'n. | 2 Pl. H Pass | | 11 Mail Ex. | 1 Day Ex. | 3 R'd L'v'd | 23 B. C. Pass. | 5 P'ge Ex. |
| a m | p m | p m | | | | p m | p m | p m | | a m |
| 9.00 | 3.10 | 8.15 | a m | ..... | .....D. Chicago A..... | 6.45 | 1.50 | 9.10 | ..... | 6.30 |
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| 1.46 | 7.12 | 12 45 | 12.40 | ..... | .....Cassopolis..... | 2.15 | 9.40 | 5.13 | ..... | 2.25 |
| 2.33 | ..... | †1.33 | 3.42 | ..... | .....Schoolcraft..... | 1.20 | ..... | ..... | ..... | ..... |
| 2.44 | 7.55 | 1.48 | 4.30 | a m | .....Vicksburg..... | 1.10 | 8.02 | ..... | p m | 1.30 |
| 3.30 | 8.36 | 2.40 | 6.20 | 7.00 | .....Battle Creek..... | 12.15 | 8.15 | 3.55 | 9.35 | 12.50 |
| 4.33 | 9.26 | 3.25 | ..... | 7.47 | .....Charlotte..... | 11.14 | 7.23 | 3.07 | 8.40 | 11.55 |
| 5.10 | 9.55 | 4.00 | ..... | 8.20 | .....Lansing..... | 10.40 | 6.55 | 2.40 | 8.00 | 11.25 |
| 6.30 | 10.45 | 5.03 | ..... | 9.30 | .....Durand..... | 9.35 | 6.05 | 1.55 | 6.50 | 10.25 |
| 7.30 | 11.17 | 5.40 | ..... | 10.05 | .....Flint..... | 8.35 | 5.35 | 1.28 | 5.47 | 9.30 |
| 8.15 | 11.50 | 6.15 | ..... | 10.43 | .....Lapeer..... | 7.49 | 5.02 | 1.00 | 5.10 | 9.05 |
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| 9.50 | 1.00 | 7.30 | ..... | 12.05 | .....Tunnel..... | 6.50 | 3.50 | 11.55 | 3.50 | 7.55 |
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| ..... | 7.00 | 5.40 | ..... | ..... | .....Buffalo..... | ..... | ..... | ..... | ..... | 1.00 |
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| ..... | 8.53 | 8.03 | ..... | ..... | .....New York..... | ..... | 8.15 | 6.10 | ..... | 9.00 |
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## ORIGINAL ARTICLES.

### REPORT OF CASES ILLUSTRATING THE SUCCESSFUL TREATMENT OF SOME SEVERE FORMS OF NERVOUS DISEASES.

BY W. H. RILEY, M. D.,
Sanitarium, Battle Creek, Mich.

A NUMBER of cases have already been reported under the above head in a previous number of this journal. The purpose of reporting these cases is not to enter into a detailed description of any diseased conditions that may be illustrated by any of the cases here reported, nor to give a minute description of the methods of treatment of any particular disease, but rather to call attention to the value of the remedies themselves in the treatment of a large number of chronic nervous diseases.

It is coming to be more and more recognized by the best minds of the medical profession that hydrotherapy, electrotherapy, and massotherapy, with careful attention to the general nutrition of the patient and the proper use of rest and exercise, are not only the most rational but the most successful methods of treatment in that large and ever-increasing class of chronic disorders of the nervous and digestive systems. To be sure, materia medica still has a place in the healing art, but to the writer's mind it is not large in the treatment of such diseases as are illustrated by the cases reported below. The scientific use of heat, cold, electricity, massage, and other manual and mechanical manipulations, together with careful attention to nutrition by regulation of the diet, the correction of bad habits of living, and the establishment of a happy and contented frame of mind by pleasant surroundings and the removal as far as possible of that which would tend to irritate or annoy the patient either mentally or physically,—these measures, when properly applied, have proved, in the writer's experience, far more successful than medication in the treatment of such diseases as are illustrated in the following cases:—

CASE I.

*Diagnosis.*—Neurasthenia, with spinal irritation.

*History.*—The patient is a man forty-seven years old who has always enjoyed good health up to the beginning of his present trouble, which he thinks was caused by taking cold about ten weeks ago, when overheated. The first symptoms that he noticed were pain extending through his chest, trunk, and arms; weakness and soreness in the arms; numbness in the hands and feet; and an uncomfortable feeling in the region of the heart. There was also tenderness and soreness along the spine. He has, at present, a feeling of general weakness and prostration, and tires easily when taking physical exercise or doing mental work. He also has disagreeable sensations about the head, and frontal headache which is more or less continuous, but not very severe in character. His circulation is poor, the extremities being usually cold. He takes cold easily, and is troubled with a cough.

*Treatment.*—The patient was placed under treatment consisting of an electric-light bath with massage twice a week; fomentations to the spine, stomach, and liver, with general faradization twice a week; fomentations to the spine, stomach, and liver, with massage twice a week; the application of the galvanic current to the spine daily, a large electrode attached to the negative pole being applied over the abdomen, and the positive pole to the spine, with a current of

fifteen milliamperes. The application of mechanical Swedish movements and a graduated course of exercises also entered into the daily program of this case. This treatment was continued for a period of three weeks, at the end of which time the patient was entirely relieved of the pain and numbness in the upper extremities and chest. The symptoms of nerve exhaustion were almost completely gone, and the patient very much improved in every respect.

### Case II.

*Diagnosis.*— Premonitory symptoms of paralysis of the right side of the body.

*History.*— The patient is a man forty-nine years old. He first came to the Sanitarium about eighteen months ago to be treated for hyperemia of the brain, with symptoms of threatened apoplexy. At this time he remained under treatment some weeks, and was entirely relieved of his distressing symptoms, and continued to feel well until about a month ago, when he experienced a sensation of numbness all through his body, and for a time had difficulty in speaking. He had had similar attacks previous to his first visit to the institution.

Examination showed a slight loss of sensation on the right side of the body and considerable loss of motor power. The knee-jerk and other reflexes in the right side of the body were increased. These symptoms affected all the right side of the body, including the face. At times his face was flushed, and he felt dizzy, and had symptoms pointing to hyperemia of the brain.

*Treatment.*— He was placed under treatment consisting of the use of hot blanket packs to his legs, warm leg baths, cold applications to the head, and the careful use of the galvanic current to the head, with massage. His digestion received careful attention, the bowels being regulated by diet and treatment, and all exercise carefully regulated and somewhat restricted. Under this program the patient continued treatment for about one month, at the end of which time the distressing symptoms were greatly relieved, and he returned home well satisfied with his stay at the institution.

### Case III.

*Diagnosis.*— Neurasthenia, with insomnia.

*History.*— The patient is a banker, fifty-six years old, whose father died at the age of fifty-two years of pulmonary trouble. About two years ago the patient had what was called inflammation of the stomach. He thinks his trouble dates from that time. He came to the institution to be treated especially for his nervous and stomach troubles. His appetite is poor; he has indigestion, and is troubled with constipation of the bowels. He also has hemorrhoids. He does not sleep well. It takes him a long time to get to sleep after retiring, and he frequently awakens somewhere between one and two o'clock in the night, and does not sleep very much afterward. He has a constant feeling of exhaustion, which is most marked in the legs, and is increased by the slightest physical exercise. He also has a sensation of pressure downward in the top of the head. He is despondent, and worries much about his business.

*Treatment.*— The patient was placed under treatment consisting of the application of various measures in hydrotherapy, the use of massage, the general application of the faradic current to the body three times a week, and the galvanic current to the head and spine daily, the use of mechanical Swedish movements, and a graduated course of exercises. To relieve the insomnia, warm electric baths were given every night just before retiring. His diet was also carefully regulated, after first obtaining the chemical analysis of the contents of the stomach after a test breakfast.

The patient continued under treatment for about six weeks, and at the end of this time his appetite was good, his digestion was much improved, he had gained several pounds in weight, was sleeping well without the use of any hypnotic, and had gained much in strength, as was shown by a careful test of the strength of the muscles taken at the beginning and again at the end of treatment.

### Case IV.

*Diagnosis.*— Chorea.

*History.*— The patient is a boy ten years old. His father is of a nervous temperament, and his mother not very strong. The boy has never been rugged. The mother thinks that his present trouble was caused by an attack of la grippe three years ago. About eighteen months ago

he began to have choreic movements in the muscles of the neck and chest, producing jerky movements of the head and shoulders. These choreic movements have continued with little or no change up to the present time, though the father thinks they have been getting worse during the past two or three weeks. These movements affect the head and neck, the upper extremities, and the muscles of the chest, and are present nearly all the time except during sleep. The patient is troubled with shortness of breath, is pale and anemic, his appetite is not very good, his digestion is impaired, bowels constipated, and he has a dry cough. At times he has a pain in the right side in the region of the heart. The action of the heart is weak and rather irritable. The reflexes, both deep and superficial, are present, and apparently normal.

*Treatment.*— This patient was placed under treatment consisting of a hot blanket pack applied to the entire body, followed by massage every other day, a warm electric bath twice a week, alternate applications of heat and cold to the spine, with the faradic current applied to the body generally once a week. The diet was carefully regulated, the patient not being allowed to eat any meat nor stimulating food; his exercise was also restricted, and allowed in only very moderate degree. The patient made rapid improvement almost from the beginning of treatment. The above program was continued, with slight modifications as symptoms seemed to indicate, and at the end of two months the choreic movements were entirely absent nearly all the time, showing themselves only at intervals of two or three weeks, and then being slight, barely suggestive of his previous serious trouble.

### Case V.

*Diagnosis.*— Indigestion with weak heart, constipation.

*History.*— The patient is a man thirty-six years old, whose trouble began about five months ago with pain in the region of the heart. He has also suffered a great deal from palpitation of the heart, which is apt to manifest itself most prominently in the latter part of the day or three or four hours after eating. His appetite is variable, digestion much disturbed, and bowels almost constantly constipated. He has hemorrhoids. He has been in the habit of smoking a great deal.

Physical examination shows that the muscles of the body are rather soft and flabby, with muscular strength rather below the normal; heart is weak and irregular, stomach somewhat prolapsed, with its muscular coats evidently relaxed and weak. The reflexes, both deep and superficial, are present, and apparently normal. With the exception of slight paresthesia in the feet and hands, there is no disturbance of sensation.

*Treatment.*— This patient was placed under treatment consisting of the use of hydrotherapy, the faradic current of electricity, massage, and a graduated course of exercises. The diet was carefully regulated, and the use of tobacco entirely prohibited. Continuing along these lines of treatment for a period of about five weeks, the patient made rapid improvement, his digestion was very much better, the heart action stronger, palpitation having entirely disappeared, and he had gained very much in strength. He left the institution practically relieved of the troubles for which he came.

### Case VI.

*Diagnosis.*— Chronic articular rheumatism.

*History.*— This patient was a man fifty-four years old. He had rheumatism in the army in 1862, and has suffered with it more or less since; has not been able to work for the last five or six years, and for the past six months has not been able to get his clothes on and off without help. The rheumatism has affected the joints of the arms and legs, and has produced swelling and deformity in some of the joints. He is very thin in flesh, and suffers more or less with rheumatic pains in different parts of the body.

*Treatment.*— He was placed under treatment consisting of the application of hot fomentations to the affected joints, the use of the electric-light and warm electric baths, massage, and the application of galvanism to the joints, with as strong a current as he could bear. The diet was also carefully regulated, and the patient was instructed to drink large quantities of water between meals.

The patient's condition improved rapidly under this treatment, and he was soon able to walk with the aid of two crutches, and a few weeks later to dis-

pense with their use entirely, getting about with one cane. After being under treatment for about two and one-half months, he was able to walk without the use of any support. He said he was better than he had been for twenty-five years, and went home delighted with his improvement. A letter received from the patient something like a year after his return home, states that he is still enjoying good health, and that the rheumatism has not given him any special trouble.

Considering the fact that this case was of more than thirty years' standing, and that it had prevented the patient from doing any physical work for six years, the case is certainly one of unusual interest, and illustrates very forcibly what can be accomplished in these cases by the persistent use of such remedies as were used.

### Case VII.

*Diagnosis.*— Partial paralysis of the right side of the body, caused by cerebral lesion.

*History.*— The patient had always enjoyed good health previous to his present trouble, which began about six months ago. He had some premonitory symptoms before the present attack developed, consisting of a feeling of numbness in the right hand, and finally an entire inability to write with it a short time before the attack developed. With these exceptions, the present apoplectic attack developed suddenly. As the result of the stroke, he was paralyzed in the right arm and leg. He was confined to his bed for three and one-half months, during which time the right arm and leg were either completely paralyzed or nearly so. About the time he got out of bed he began to improve, and has been improving slowly ever since. At the present time he is able to walk by the aid of a cane, and uses his right arm some. There is very little, if any, loss of sensation on the right side of the body. He complains some of numbness in the right leg and arm. The knee-jerk in both limbs is increased, but much more so in the right than in the left. There is no ankle clonus. At the beginning of his present trouble he had aphasia. The difficulty with his speech at the present time may be properly expressed by the term "paraphasia," that is, he misplaces words, and calls things by the wrong names. He has more or less vertigo, quite pronounced in the morning. He is partially deaf in both ears. The right ear became affected at the time of his stroke of paralysis. His appetite is good, digestion fair, and bowels regular.

*Treatment.*— The indications for the treatment of this class of cases may be considered under the following heads: —

1. To prevent the occurrence of other attacks.
2. To diminish the amount of blood in the brain, and reduce the blood pressure within the cerebral arteries.
3. To remove, if possible, the pathological lesion.
4. To restore the function of the paralyzed muscles.

The writer believes that these indications for treatment are best met by the proper use of hydrotherapy, massage, and electricity, together with a carefully regulated diet, and the restriction and regulation of the exercise. Besides these remedies, the use of bromide of potassium taken internally in the early stages of the disease, followed later by the use of potassium iodide in free doses, seems to be of some help in the treatment of these cases.

Under this treatment, in one month's time the patient was very much improved. He had better use of the lower limbs in walking, and could use his arm very much better than when he came. A comparison of the strength of the muscles at the time of leaving off treatment with that when he began shows a decided gain in muscular power.

### Case VIII.

*Diagnosis.*— Sciatica.

*History.*— The patient is a man eighty years old, who has usually enjoyed good health, never having had any severe illness. About ten years ago he began to have severe pains along the course of the sciatic nerve in the right hip and leg. After a time he recovered from this attack, and has not since been troubled with it until about four months ago, when he had another attack. He came to the Sanitarium especially to be treated for this sciatic trouble. Besides this he has some indigestion, sourness of the stomach and gas on the stomach, with irritation of the rectum; he has cold hands and feet; there is tenderness along the course of the right sciatic nerve; the

right limb is weaker than the left, and the muscles somewhat soft and shrunken.

*Treatment.*— He was placed under treatment consisting of a continuous application of heat to the right sciatic nerve for one hour twice daily. The galvanic current was also applied along the course of the sciatic nerve, a large electrode attached to a negative pole being used, and applied over the abdomen, while the positive electrode was applied along the course of the sciatic nerve. A current of about twenty milliamperes was employed, and applied daily for twenty minutes at each séance. He was also placed on a course of tonic treatment to improve his general health and digestion.

The patient continued this treatment for about one month, at the end of which time he was entirely relieved of the trouble for which he came to the institution.

### Case IX.

*Diagnosis.*— Paresthesia in the extremities, neuralgia of the stomach.

*History.*— The patient had the grippe about eight or nine months ago, since which time he has had pain in different parts of the body and a peculiar feeling of numbness in his hands, arms, feet, and legs. He also has considerable pain in the stomach, accompanied by indigestion. Recently he has been drinking alcoholic liquors to relieve the pain in the stomach. He came to the Sanitarium to receive treatment for these troubles.

*Treatment.*— The pain and paresthesia in the extremities were successfully treated by the alternate application of a hot and cold spray to the extremities, the hot water being first applied as warm as the patient could comfortably bear it for a period of two minutes, and followed by the cool spray at a temperature of sixty degrees for one minute. The heat and cold was alternated in this way, the application being continued for ten minutes at each séance, and applied twice a day. Besides this, the galvanic current was applied to the extremities and the spine, the positive pole being used over the seat of pain and paresthesia, while the negative pole was employed at some indifferent point, as over the abdomen. By using the large electrode attached to the negative pole and applied at some indifferent point of the body, the resistance in the circuit is considerably diminished, and the patient consequently able to bear a stronger current, the effect of which is intensified in the region of the positive electrode, where it is most needed, the positive electrode being applied over the seat of the sensory disturbance in the arms and legs. In addition to this treatment, the patient received massage, with general application of the faradic current to tone up the muscles of the body generally. The use of all alcoholic liquors as well as tobacco was strictly prohibited; the habits of the patient as to time of meals, articles of food eaten, exercise, rest, etc., were all carefully regulated. Under this regimen the patient improved rapidly, and at the end of one month's time he was entirely relieved of the distressing symptoms for which he came for treatment.

### Case X.

*Diagnosis.*— Nerve exhaustion, indigestion, mental depression.

*History.*— The patient is a man fifty-eight years of age; has been in active business for the past twenty years. During the last two years he has worried a great deal about business matters, has been mentally depressed, and has not slept well. To produce sleep he has been taking hypnotics. He has been exceedingly nervous, having a constant feeling of fatigue, which is increased by very moderate physical exercise or mental work. He has used alcoholic liquors to some extent, but not for the past two years. His appetite is fairly good, but he complains of being bilious at times. He thinks his liver is torpid; his bowels are constipated, and he is troubled with indigestion. He has shortness of breath, and takes cold easily. He has a confused, and constricted feeling across his forehead; a dull, heavy, aching pain in the occipital region of the head, and a pressure downward on the top of the head. These pains in the head are as a rule increased by exercise. He has difficulty in getting to sleep when he retires, and usually wakes up between twelve and two o'clock, and sleeps but little afterward. He says he usually sleeps only from two to six hours out of the twenty-four. He wakes in the morning unrefreshed, and as a rule feels worse in the morning than at any other time in the day. He is morbid, and apprehensive about his mental con-

dition, and is afraid that he will lose his mind. He has been under treatment with drugs for the past two years by various physicians, but has made no improvement.

*Treatment.*— The patient was placed under treatment as follows: In the morning on rising, he was given a salt bath followed by a brisk rub all over the body and special massage to the bowels. Later in the day, when the pains in his head were at their worst, the galvanic current was applied to his head and spine, a current of from five to eight milliamperes being used to the head and one of fifteen to twenty to the spine. The current was applied for fifteen minutes daily. A careful test was taken of his muscular strength, and he was placed on a graduated course of exercise. In the evening his treatment consisted of a warm electric bath, followed by massage. The purpose of giving this treatment at this time of day was to induce sleep.

The patient made very rapid improvement almost from the first. In two weeks' time he was sleeping well, and had gained some in flesh. The distressing symptoms in his head gradually disappeared; he became more cheerful, his fears about himself gradually fading away; and in a short time he was well on the way to health. He continued under treatment for two months, at the end of which time he was entirely relieved of all his troubles, had gained twenty-five pounds in flesh and very much in strength. His appearance had entirely changed from that of a person who is pale and anemic from loss of sleep to that of a person in good health, with a ruddy complexion. He left the institution delighted with his improvement, and feeling that the treatment he had received had saved his life, and kept him from the insane asylum.

He returned home and resumed his duties in an important position in one of our principal railroad systems. In a letter received from him a year later he reports himself enjoying the very best of health, and able to attend to his business.

(To be continued.)

## MECHANICAL EXERCISE.

BY J. H. KELLOGG, M. D.

(Continued.)

MECHANICAL kneading of the arms is executed by means of the apparatus shown in Fig. 9. When the pressure is made sufficient to prevent the rubbers from slipping over the surface, the movement is that of rolling, a form of deep kneading; with lighter pressure, it is that of friction. This is a valuable mode of utilizing mechanical massage. The time of application is from three to five minutes.

The legs may receive mechanical massage by means of a similar apparatus, shown in Fig. 10. This is an excellent means of aiding the circulation in cases in which the legs and feet are habitually cold. The application should be continued from five to eight minutes, or until the extremities are thoroughly warmed.

Mechanical kneading of various parts may be employed, as is also shown in Fig. 9. The apparatus utilized is similar to that used for rotary vibration of the feet. A suitable pad is secured at the end of a bar, which is made to rotate while it rests against any portion of the trunk to which it can be conveniently applied. It is especially useful in making applications to the back, stomach, bowels, shoulders, and the region of the liver. In cases of gallstones, it is a most excellent means of jostling imbedded calculi down into the bile duct, thereby hastening the emptying of the gall-bladder. It also facilitates the discharge of the fluid contents of the gall-bladder, and is thus a valuable aid to digestion. It will be apparent from these observations that this particular form of apparatus is a very efficient form of vibration, as well as a thorough kneading procedure. The time of application should be from one to three minutes to each part.

*Trunk Rolling.*— The apparatus represented in use in Fig. 11, consists of a pair of pulleys moving in alternation and in opposite directions, a fraction of a revolution in each direction. To each pulley is attached one end of a broad strap, which is passed around the trunk in such a manner that, as the strap is pulled first in one direction and then in the opposite, the tissues are acted upon very much as in certain forms of palmar kneading. When applied about the waist, it is a very excellent means of administering a rolling movement to the muscles of the trunk, and a shaking movement to the viscera; when applied across the shoulders, the effect is that of deep kneading. This is a favorite apparatus with patients who are under treatment by mechanical massage.

FIG. 9.— APPARATUS FOR KNEADING THE ARMS.

FIG. 10 — APPARATUS FOR KNEADING THE LEGS.

FIG. 11.— TRUNK ROLLING.

FIG. 12.— APPARATUS FOR MECHANICAL PERCUSSION

FIG. 13. — BEATING APPARATUS

FIG. 14 — MECHANICAL FRICTION OF THE FEET.

FIG. 15 — TILTING-TABLE.

FIG. 16. — PELVIS-TILTING

It was devised by the author about ten years ago. This application is so vigorous that it is not usually continued more than two to four minutes.

*Mechanical Percussion.*— There are two forms of percussion which may be administered mechanically; viz., (1) slapping; (2) beating.

*Slapping* is administered mechanically by means of a vertical revolving bar, to which is attached a broad strap about sixteen inches in length (Fig. 12). The strap is fastened to the bar at its middle, the two ends being free; and thus two blows are struck at each revolution. Different degrees of force are secured by modifications of the speed with which the bar is made to revolve, the thickness of the strap, and the position of the patient in relation to the bar and the strap. The time of the application is one to three minutes.

Mechanical slapping is a most effective measure for stimulating the surface circulation. In this respect it is not excelled by any procedure which can be administered by the hand. It is most usefully applied to the shoulders and back, the legs and thighs, and the soles of the feet.

*Mechanical Beating* (Fig. 13) is an efficient mode of percussion, though less valuable in comparison with beating administered by the hand than is mechanical percussion in comparison with manual percussion. It is most effectively applied to the spine and chest, and over the abdomen. The apparatus shown was devised simultaneously by the writer and by Zander, of Stockholm. The usual time of application is from two to four minutes.

*Mechanical Friction.*— Friction may be applied to the soles of the feet by a revolving ribbed cylinder (Fig. 14), which was first used by Zander. The writer has added a number of features which have proved serviceable. One of these is the employment of an apron to cover the ribs of the revolving cylinder, thus preventing the wearing upon the patient's stockings or slippers; another improvement is the insulation of the chair in which the patient sits, which I was led to make by noticing that sparks could often be drawn from different parts of the patient's body while receiving treatment from the apparatus. It is not an uncommon thing to see the hair of a patient sitting in the insulated seat, erected by the electric charge generated by the friction of the machine. It is possible that a certain portion of the static electricity may be generated by the driving belt. This phenomenon is of course chiefly confined to the colder months, when the atmosphere is dry.

The apparatus is a very valuable one, as it performs its work efficiently, and does something which cannot be so well accomplished in any other way. It is a favorite machine with our patients. The application is a very agreeable one, and may be continued almost *ad libitum* without injury. The usual time is from five to ten minutes.

*Tilting Table.*— In Fig. 15 is represented a tilting table, which the writer devised nearly twelve years ago, and has had in use since. The patient lies upon his back while one end of the table-top is lifted by means of a large cam operating beneath it. The patient lies with his head at the stationary end of the table.

The purpose of this apparatus is to secure what I have termed "vasomotor gymnastics." When the hand is raised above the head, a strong contraction of its blood-vessels occurs, the effect being rendered visible to the eye by blanching of the skin. At the same time that the blood-vessels of the arm are thus made to contract by a vasomotor reflex, the vessels of the corresponding portion of the brain also contract. By a repetition of the movement, real gymnastics of the muscular walls of the vessels may be executed, and thus relaxed vessels be contracted and strengthened, and local congestion relieved, if so situated as to come within the sphere of the reflex action set up by the change in the position of the arm.

The same principle applies with equal force to the lower extremities, which have a relation to the organs of the pelvis similar to that which the arms sustain to the brain. Leg-raising, with the patient lying in a horizontal position, is one of the recognized and most valuable movements in the medical gymnastics of the Swedes. There is, however, a certain disadvantage in this mode of exciting vascular contraction. It is impossible to raise a limb by voluntary effort without a certain degree of strain, which involves holding the breath, and producing, as a result, an increase of pelvic and portal congestion, so that the exercise must to some degree defeat its own purpose. In

this exercise, also, but one leg is raised at once. When the lower part of the body is elevated mechanically, there is no exertion on the part of the patient, consequently no strain, and both limbs are elevated at the same time; thus the maximum effect is obtained.

This apparatus is of great service in all forms of pelvic congestion, in ovarian disease, uterine catarrh, displacements of the pelvic viscera, and in rectal disease of various forms. After spending a few minutes upon the tilting table, rising and falling with its oscillations at the rate of about eight times a minute, patients suffering from the maladies named and others similar, almost invariably express themselves as experiencing a marked sense of relief. The effects of this mode of passive exercise of the blood-vessels are so agreeable that patients are inclined to continue the application as long as they are allowed to do so. As a rule, ten to fifteen minutes will secure decided physiological effects.

*Pelvis Tilting.*— Nearly all forms of pelvic disease give indications for the use of the tilting table above described. In displacement of the womb or ovaries, however, as well as of the stomach, liver, kidneys, bowels, and other abdominal organs, it is important to combine with the vasomotor gymnastics described, the employment of position as an aid to restoration of the displaced viscera. This is accomplished by adding to the tilting table above described a device by means of which the pelvis is lifted free from the table while the patient lies upon the face, thus causing the abdominal wall to sag downward (Fig. 16). As the table is tilted, the patient is lifted into such a position as to cause gravity to make an upward (in relation to the normal position) pull upon the viscera of the trunk. The device consists simply of an attachment placed in the center of the table, which is made to rise more rapidly than the table itself, thus lifting the pelvis before the rest of the body, and holding it in this relation until the table returns to a state of rest. The effect of this apparatus is increased, if, while the patient is elevated, the attendant applies percussion or beating to the sacral region.

The use of this apparatus alone is not sufficient to restore displaced organs to position, but it aids greatly in relieving congestion, and is certainly a help toward a cure of visceral prolapse. The application should be made daily, or twice daily, and continued from eight to ten minutes.

(To be concluded.)

## A NEW OPERATION FOR RETROVERSION.

BY J. H. KELLOGG, M. D.

ANTERIOR vaginal fixation, as first suggested by Dülerssen, consists in opening the peritoneal cavity between the uterus and the bladder, by incising the vaginal canal just anteriorly to the cervix, and separating, by careful dissection, the uterus and the bladder. A suture is then inserted into the body of the uterus near the top of the fundus, and the fundus drawn forward, and attached to the edges of the vaginal wound.

This operation may be considered as a very satisfactory one. However, it was the impression of the writer that it might be improved if it could be performed without invading the peritoneal cavity. A year or two ago, in performing the operation of vaginal hysterectomy, the writer succeeded in enucleating the entire uterus from its connective tissue capsule without opening the abdominal cavity, and without the application of a ligature or clamp. Only two or three snap forceps were applied. This had been previously done by others. The comparative ease with which the operation was performed suggested the possibility of performing anterior fixation of the uterus without penetrating the peritoneal cavity.

On Feb. 5, 1896, I undertook this operation for relief of a case of retroversion, and found the operation not more difficult than I had anticipated. A curved incision was made, extending over about two fifths of the circumference of the cervix, at its junction with the vagina. By combining the use of the scissors, the handle of the knife, and the finger, I was able to separate the capsule to the top of the fundus. A silkworm-gut suture was passed deeply into the tissues at this point, the two ends of the suture being passed through the edges of the vaginal wound. In tying the suture the uterus was anteflexed. The suture was left in place for four weeks. By this method the surfaces are brought together in the tightening of the suture in such a manner as to secure immediate and perfect union; the anterior

wall of the uterus is shortened, and the uterus tilted forward.

This operation, in the opinion of the writer, possesses advantages over every other which has been proposed for the relief of retroversion, with the exception of that of shortening the round ligaments. The latter operation, which the writer has performed more than four hundred and fifty times, with no mortality, and less than five per cent. of failures, unquestionably affords the most physiological and practical method of dealing with retroversion in the great majority of cases. Cases of retroflexion, and those in which the uterus is so lacking in tone and so flexible that it has a tendency to tip backward, even though the ligaments have been well shortened, are also suitable subjects for this operation, which may be combined with the operation of shortening the ligaments. The failures which the writer has encountered are mainly of this class. By a combination of extra-peritoneal anterior vaginal fixation with the operation of shortening the ligaments, the uterus may be most securely fixed in position, no matter of how long standing the retroversion may be, nor how extreme the degree of displacement.

The operation requires some experience and skill, a thorough knowledge of the anatomy of the parts, a delicate touch, and great care to avoid penetrating the bladder or the peritoneal cavity; but neither of these accidents is likely to occur if the operator is sufficiently experienced. Care must also be taken to avoid wounding the ureters, and also to avoid injury to large blood-vessels. The dissection is made largely with the finger and the handle of the knife. The most difficult part of the operation is the insertion of the suture, which must be accomplished largely by the sense of touch. The suture is looped through the eye of the long Hagedorn needle, the needle inserted into the tissues as near the top of the fundus as possible, and the loop caught by a hook, the needle drawn back, and one end of the suture drawn through. One end of the suture is then passed through the tissues on the upper side of the vaginal wound; and the other is inserted deeply into the tissues of the cervix, so that when the suture is tightened at the closing of the operation, the fundus is drawn toward the cervix, until slightly anteflexed. No inflammatory reaction occurs, and there is little or no suffering from the operation.

The tissues which fall together are raw surfaces, and unite by immediate union, so that the uterus is very solidly fixed in its forward position. The field of the operation extends so little beyond the median line, on either side, that no large blood-vessels are involved. In the cases in which I have operated, I have not found it necessary to apply a single ligature, three sutures having proved sufficient to close the wound. The peritoneal cavity is not invaded, and, so far as the writer knows, this is the simplest method that has yet been devised for anterior fixation of the uterus. Dr. Vineberg, of New York, has reported a large number of cases in which he has satisfactorily employed anterior vaginal fixation, and from his description of the surgical methods of treatment of retro-displacements of the uterus, before the New York Academy of Medicine, the writer has the impression that Dr. Vineberg, has sometimes completed the operation of anterior vaginal fixation without entering the peritoneal cavity, though the method which he described involved the suturing of the broad ligaments, which would seem to necessitate the opening of the peritoneal cavity. This operation is one which should be reserved for cases in which pregnancy is not likely to occur, as recent observations have shown that anterior vaginal fixation interferes with gestation.

**The Transmission of Tuberculosis.** — From experiments recently made by Jäckh (*Virch. Arch.*, 1895), it seems to be proved that tuberculosis may be transmitted from the male through the agency of the seminal fluid. The semen from tuberculous patients who had died from either chronic or acute pulmonary tuberculosis, when introduced into the abdomen of guinea-pigs and rabbits, gave positive results in nearly every case.

**Toxin and Antitoxin in the Blood.** — A toxin exactly like that found in the venom, but associated with an antitoxin, is found in the blood of a viper. Exposed to a heat of 588° C., this toxin disappears in fifteen minutes, leaving the antitoxin, which renders immune against viper's poison animals into which it is injected.

# TRANSLATIONS AND ABSTRACTS

[THE articles in this department are prepared expressly for this journal.]

## EFFECTS OF MASSAGE UPON THE CIRCULATION.

DR. GEORGE OLIVER, in a recent lecture delivered before the Royal College of Physicians at London, gave an excellent summary of the effects of massage upon the circulation of the blood, which we quote from the *British Medical Journal* for June 13, 1896, as follows: —

"The circulation of blood through the manipulated tissues is accelerated and increased. This fact has been clearly demonstrated experimentally on dogs and cats by Lauder Brunton, and Tunnicliffe: —

"'1. During the massage of muscles the flow of blood through them is increased.

"'2. Immediately after the cessation of massage an accumulation of blood occurs in the massaged muscles; this is rapidly followed by an increased flow through the muscles.

"'3. The massage of a considerable muscular area causes first a slight rise in the general blood pressure; this is followed by a fall which in some cases amounts to one fifth of the initial blood pressure.'

"The results of my observations in man coincide with these conclusions. The local effects on the radial pulse are easily learned by applying the various forms of massage to the muscles of the forearm. The lighter and superficial manipulations, such as stroking, *effleurage;* and vibratory movements or percussion such as hacking, punctuation, slapping, etc., raise the radial blood pressure and caliber; while the intermittent rolling and squeezing of the muscular tissue (*pétrissage*) reduce them.

"The immediate effect of all the forms of massage is to raise the blood pressure and to enlarge the caliber of the artery. This preliminary stage is maintained for some time while the more superficial and vibratory manipulations are being employed; but it is very transitory indeed when that form of massage is applied which freely moves the muscular tissue, and is quickly followed by a very decided and sharp reduction of the radial caliber.

"From this it would seem probable that the first effect of massage in its various forms — and an effect which is, moreover, maintained throughout the application of the superficial and vibratory manipulations when limited in duration — is to induce vasomotor contraction in the terminal vessels, and thus to raise the blood pressure and the caliber in the intermediate arterial tubing between them and the heart. This may, therefore, be regarded as the vasomotor tonic aspect of massage when that process assumes the forms of stroking, vibration, and percussion, which therefore raise arterial tension. When, however, the muscular tissue is freely manipulated and rolled, the vessels therein dilate, and the flow of blood through them is increased and accelerated by the rapid manipulations acting in the manner of a supplementary heart, and the blood pressure and caliber of the radial and other systematic arteries fall. This is the vasomotor relaxant effect of massage which reduces arterial tension. When the muscles of all the limbs are manipulated, the radial caliber and pressure fall. There may be perceived a large ictus after the manipulations, but it is unsafe to infer therefrom that the radial caliber is increased; for arteriometric measurement has shown that when the pulse tension is reduced, the pulse-stroke generally feels larger, though the caliber of the vessel is actually diminished.

"The diversion of the blood to the capacious periphery located in the muscles is no doubt a leading cause. But there is some evidence that points to the conclusion that this may not be the sole cause.

"When vigorous massage is applied to the back and the limbs for twenty or thirty minutes, the normal postural variations of the radial caliber and pressure are apt to become — if they do not invariably become — reversed, so that they measure less in the sitting than in the recumbent posture; and when this happens, it has been found that manipulation of the abdomen for eight or ten minutes restores the normal formula of the pulse.

"It would, therefore, seem probable that massage, when confined to the systematic muscles, disposes to the accumulation of blood within the capacious venous system of the abdomen. Glovetzky made

a large number of experiments on men and dogs to show the effects of abdominal massage on the circulation. He found that the upper half of the body increased in weight after the séance, as shown by Mosso's balance, and plethysmographic measurements proved that during the sitting, both the upper and lower extremities increased in volume, but returned to their normal size after the massage. The blood tension and the intracranial pressure invariably rose during the massage, and the elevation lasted for a certain period afterwards.

"But though a short application of abdominal massage may restore the normal contraction of the vessels supplied by the splanchnic nerves, its continuance beyond a very limited period is apt to defeat the aim in view; for then it is not improbable either that the contractility of the vessels becomes exhausted, and dilatation of them is thus favored, or the heart's action is lowered through reflex overstimulation. So that it would seem to be best, as a rule, to apply massage to the abdomen in some of its vibratory forms, and for a brief period only, and after the general massage has been performed.

"*Massage and Exercise.*— It has been pointed out that in exercise — local and general — the volume of the limb is considerably increased from the afflux, and probably also from the infiltration of watery fluid from the gorged vessels into the substance of the muscles. Volumetric observation of the arm has shown that massage, when applied for a short time — for example, from seven to ten minutes — generally induces a slight diminution of the limb. Therefore, it would seem probable that any watery exudation that may flow from the blood is pressed forward from the lymph spaces into the lymphatics.

"The practical outcome of these observations, which probably coincides in the main with the teachings of general experience in regard to massage, seems to be the following: —

"Massage should not be prescribed and performed in a mere perfunctory routine fashion, as is to be feared it too often is, but, like other therapeutic measures, it should be applied with due discrimination. The leading features of the circulation are the best indications for the selection of the kind of manipulations to be adopted, for the limitation of the time of their application, and for the distribution of them, whether mainly to the viscera or to the systemic muscles. When, for example, the vasotonic effects are sought for, the manipulations should partake chiefly of the nature of vibration or percussion; and in those cases in which muscle kneading is resorted to, percussion should terminate the process. When, on the other hand, the aim is to reduce arterial tension and to relieve the ventricular effort, the deep movements should be preferred throughout, and should be applied only to the limbs and back, the abdomen not to be manipulated.

"RESISTIVE MOVEMENTS.

"Certain exercises in which the operator offers resistance are of special value in the development of the muscles, and in the acquirement of muscular tone and vigor. This system of exercise to which I refer is known as the Swedish system. Nearly fifty years ago, Saetherberg, of Stockholm, applied this method to the treatment of heart disease, and reported his results some fifteen years later; and following him, one or two other observers have shown the value of resistive gymnastics in cardiac disease. But the method has only of late years acquired prominence as a definite therapeutic mode of treating failing compensation of the heart since the brothers August and Theodor Schott modified it in certain respects, and applied it under proper restrictions, either in conjunction with or apart from the baths administered at Bad Nauheim.

"The few observations to be adduced refer only to the physiology of these exercises, or rather as to how the results which are believed by some to be obtained from them are brought about. Two somewhat conflicting theories are entertained. On the one hand, Dr. Theodor Schott ascribes it to reflex stimulation of the cardiac inhibitory nerves, causing the heart to beat more forcibly and more slowly; on the other hand, Dr. Bezly Thorne, Sir William, and Dr. John Broadbent, refer it to dilatation of the arteries supplied to the muscles. I have merely to submit a few observations on several healthy subjects, ranging in age from thirty-two to forty-six, which may be regarded as having a bearing on one of these views.

"In one case, that of a healthy doctor aged thirty-seven, the five arm movements were distributed over thirty minutes, the intervals of rest being equal to the duration of the exercises. At the termination of the first exercise, the caliber was found to be two points and the pressure ten points higher, but after each of the four subsequent exercises the caliber and the pressure were found to fall rapidly; and at the close of the observation, the former was found to be nearly 1 millimeter and the latter thirty points lower than the initial records. The frequency of the pulse fell from 88 to 82 (sitting).

"In another case of a healthy man, aged forty-six, subjected for thirty minutes to the arm exercises, followed by forty minutes' rest, succeeded by the three trunk movements, there was also an initial rise of radial caliber and pressure, followed by a rapid fall; and after the long interval of rest this reduction was further intensified by the trunk movements. The pulse rate fell from 84 to 74 (sitting).

"In a subject aged twenty-six, the volume of the arm was measured before and after four arm exercises of two minutes each, interrupted by one minute of rest. The initial volume of 1648 c. cm. was increased to 1696 c. cm., and the increment was entirely removed by the application of massage for fifteen minutes, and was replaced by the resistive movements for ten minutes.

"It has been observed that the increased volume caused by the resistive exercises may persist for several hours. These observations in healthy subjects have shown that the slow resistive exercises produce the following effects on the limb and on the radial pulse: —

"1. An increase in the volume of the limb.

"2. At first a rise and then a decided fall in radial blood pressure and caliber.

"3. A reduction of the frequency of the pulse.

"The reduction of the radial pressure and caliber is no doubt due to the diversion of a large volume of blood to the capacious muscular periphery. The immediate increase of the volume of the limb is direct proof of this fact; but as in ordinary exercise, the persistence of the enlargement for many hours shows that it is not due entirely to the temporary filling of the vessels within the muscles, but probably arises from an infiltration of fluid derived from the blood into the muscular tissue. This system of regulative movements, therefore, produces all the local physiological effects of exercise; but it prominently differs from ordinary exercise in one respect; namely, in the slowing of the heart's action. In general exercise the condition of the radial artery does not truly indicate the degree of tension that exists within the central arterial system from the augmented propulsion of blood into it; for the blood pressure at the point of observation is reduced by the dilatation of the branches which at higher points convey the increased flow of blood to the muscles.

"In the early stage of exercise the radial tension is increased; but this is transitory, and is replaced by a reduction when the muscles begin to monopolize the blood supply. Exactly the same thing occurs as a result of the resistive exercises. As a matter of fact, it is known that in general exercise there is an increase of the mean blood pressure, notwithstanding the enormous diversion of blood to the muscles. But if the resistive movement method is but a form of exercise, why should it slow the heart while exercise accelerates it? It may be presumed that there is in both a rise in the mean blood pressure. According to Marey's law, there should be in both a slowing of the heart's action. In exercise it is obvious that the operation of this law is disturbed by other concomitant conditions, which determine an acceleration of the vascular pump, and by the increase of the respiratory movements. Now, when the resistive exercises are practised, the greatest care is taken not to allow the movements to accelerate the patient's breathing, and he is directed to breathe calmly and regularly; so there is eliminated from this mode of exercise the main, if not the sole, cause of the acceleration of the heart which is invariably present in ordinary exercise; and the slowing of the vascular pump is just as likely, perhaps more likely, to be due to a slight rise in the aortic pressure as to reflex cardiac inhibition (the theory of Dr. Schott). The former view, which was pointed out by Dr. Saundby, is more in accord with our knowledge of the physiology of exercise than the latter; and, moreover, it affords a reason why the exercises are regarded by Dr. Theodor Schott and others as un-

suited to cases of myocarditis, of aortic aneurism, and of advanced arterio-sclerosis.

"The examination of the radial pulse by means of the finger and of the sphygmograph affords but equivocal evidence bearing on this point; and from what we know of the anatomical relations of the radial artery to the muscles, and of the physiological influence of the circulation through the muscles on the radial tension, it becomes, I think, somewhat doubtful if the radial pulse can afford trustworthy evidence of any alteration in the blood pressure which may be induced in the large arteries by the exercises.

"It should be observed that the retardation of the heart's action, as well as the copious delivery of blood into the muscular periphery, must greatly limit and reduce any rise of arterial blood pressure that may take place. Hence these modulated movements throw less strain on the central arteries than ordinary exercise. The slowing of the heart is, therefore, a favorable sign; for it is an indication that the rise of blood pressure is being reduced by inhibition, and that the ventricle is not being subjected to an injurious strain by the exercises, and is duly responding to them in a more complete delivery of the blood.

"Doubtless the immediate relief to the loaded heart afforded by this therapeutic method should be ascribed to the aspiration of a large volume of blood into the capacious muscular periphery by means of the tonic contraction of all the systemic muscles, so gentle and so maintained as just to fall short of stimulating the respiratory center. The blood thus determined to the periphery must gradually return to the heart; and if the relief obtained is entirely due to this diversion of the blood, it will be of comparatively short duration. But there is some reason to believe that the volume of the blood is reduced during its sojourn through the muscles, and if the fluid withdrawn from the blood, lodges for some time in the muscular tissue, the intervals of relief should be prolonged.

"The total outcome, therefore, of the exercises is a transference of blood from the venous to the arterial side of the circulation, and a probable reduction of the volume of the blood.

"I think it is not improbable that under physiological conditions the ventricular output is not, as a rule, ample enough to maintain the normal volume of the blood in the arteries while they are being largely depleted by the increased drain into the muscles in a state of vigorous contraction; whereas, when the ventricle is dilated, which involves dilatation of the other chambers of the heart, and can be incited to throw off the augmented load of residual blood, the arterial tension may rise in spite of the increased flow into the muscles.

"This strictly physiological mode of developing and invigorating the walls of the heart, when applied with proper care and discrimination, is a therapeutic method of some value, and is a distinct addition to our resources for the treatment of failing compensation of the heart. I have observed several times that it has restored compensation after the complete failure of drugs, and that it is in suitable cases a useful auxiliary to other treatment. Like any other remedial method of decided power, it may do harm when inappropriately or improperly applied. In all cases I have found that the greatest caution should be exercised — especially in the early application of the method — to reduce the rate of the exercises to a minimum. There is often a disposition on the part of the operator to quicken the speed; this should always be deprecated unless such acceleration is fully warranted by the improvement attained.

"There is no reason why the principle which underlies this physiological method of treatment; namely, tonic contraction of successive groups of muscles, should not be attained in other ways and especially by mechanical means. Much may be done by the patient himself without an operator; and it has been found that autoresistive exercises are useful in maintaining the advantage gained in the first instance, by the ordinary application of the method."

## CYCLIC ALBUMINURIA.

In an excellent lecture upon this subject, delivered at the Hotel Dieu, Paris, by Dr. Pierre Marie, and reported in a recent number of the *Medical Week*, this eminent physician gives a very graphic description of this little-known disorder which is an occasional cause of great perplexity to physicians.

Cyclic albuminuria is characterized by the appearance of albumin in the urine of an apparently healthy subject, in an intermittent manner, and subject to certain influences. In some cases the albumin appears only when the patient is standing or active during the daytime, and disappears wholly during sleep. Muscular exercise and an upright position seem to be the principal causes which influence the appearance of albumin in the urine in these cases.

Albumin is sometimes produced alsc by the itch parasite and other causes of skin irritation. This ephemeral albuminuria, however, occurring in connection with skin diseases, and sometimes in persons who are in perfect health, is not true cyclic albuminuria. The taking of food, as is well known, sometimes gives rise to the appearance of albumin in the urine. Cold, and particularly cold baths, produce the same effect. A storm, mental worry or anxiety, and the influences which affect the nervous system may give rise to albumin in the urine, even when the patient remains in a horizontal position.

The amount of albumin which appears in these cases is always small, rarely exceeding one tenth of one per cent.; generally less. The specific gravity of the urine is usually normal or above normal. The acidity is somewhat increased. There is an increase of coloring matter, and an increase in the amount of urates and of urea. The cycle usually lasts from twelve to thirty-six hours.

This disease is most frequent in males. Of fifty-three cases, forty-nine were men. The disease is frequently observed under the age of fifteen years, and rarely noticed after thirty years. The causes are obscure. The disease sometimes appears to be a family characteristic. According to Teissier, it occurs most frequently in the children of gouty and arthritic parents,— another illustration of the proverb, "The fathers have eaten sour grapes, and the children's teeth are set on edge."

Pavy regards cyclic albuminuria as a dietetic disease analogous to the phosphatic diathesis. Merely and Teissier regard the disease as the result of imperfect oxidation of the albuminoids or a disease of "retarded nutrition" (Bouchard).

Teissier has recently suggested that this disease may be due to the functional activity of the liver. Exudates are frequently found in great excess in the urine. Moxon believes the disease to be due to an irritation of the parenchyma of the kidney by the passage of oxalates. Bull, Talamon, and others also attribute the disease to an irritation of the kidney indicative of an organic lesion of the organ,— a sort of latent nephritis which may develop, in later years, as shown by Lecorché and Talamon, in a small, contracted kidney.

To the influence of the great sympathetic must be attributed the appearance of albumin in the urine, as well as many other symptoms which are due to vasomotor disturbance. It is very likely that the upright position acts upon the kidney through the influence of this posture upon the sympathetic, and less upon the kidney. In the upright position the sympathetic must be more or less stimulated by the tension of the viscera upon the branches of the great sympathetic distributed to them.

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**Effects of Baths upon the Circulation.**— Dr. George Oliver, in a Croonian lecture recently published in the *British Medical Journal*, thus summarizes the influence of baths upon the circulation: —

"It may be said that the leading effects of baths on the circulation are due to temperature; and as the results of observation with the arteriometer coincide with the generally accepted views on the influence of baths and temperature on the vasomotor system, I will merely state the conclusions which they support.

"*The Hot Bath.*— It has been observed that hot immersion baths (from 100° to 105° F.) quickly reduce the radial caliber and pressure from the rapid dilatation which takes place in the arterioles and the cutaneous periphery. From this cause the volume of a limb taken immediately after the immersion is found to be considerably increased, but the increment rapidly subsides. In one example, the initial volume of 1640 c. cm., was raised by the hot bath to 1744 c. cm., which fell in five minutes to 1680 c. cm., and in ten minutes to 1664 c. cm. The enlargement is obviously due to a temporary turgescence of vessels, and therefore differs from that caused by exercise.

"Warm immersion baths (from 96° to

100° F.) enlarge the radial caliber, though after a certain time the peripheral vessels become relaxed and filled, and the radial is consequently reduced.

"Turkish baths, like hot immersion baths, quickly congest the cutaneous peripheral vessels and the veins, and consequently reduce the arterial pressure. When followed by the cold shower, the arterial pressure immediately rises and the radial caliber consequently increases, but may not quite attain its former size. It will be shown in another lecture that the volume of the blood is frequently much reduced.

"*The Hot Foot Bath.*—The well-known revulsive action of the hot foot bath in reducing the arterial fulness in the upper part of the body has been illustrated by the arteriometer, for it has shown that an immersion of twenty minutes may reduce the radial diameter from 2.2 mm. to 1.3 mm. The same fact was demonstrated by Winternitz as the result of the warm sitz bath, for he found that the plethysmograph indicated a reduction of the size of the arm; and Schüller observed that the vessels of the exposed pia mater of the rabbit were diminished in size in proportion to the extent of the body immersed in warm water.

"*The Cold Bath.*—It has been observed that immersion in plain water of temperature below 90° F. produces contraction of the systemic arteries within three minutes, the amount of contraction being proportionate to the reduction of the temperature. It would seem from the experiments of Schüller that the blood thus diverted from the outer vascular area congests the vessels within; for on immersing rabbits into cold baths he observed dilatation of the vessels of the pia mater (exposed by trephining) in proportion to the extent of immersion. This diversion of the blood from the surface is, however, but temporary, and is followed by increased fulness of the systemic vessels after the immersion is over, or even while it continues if the subject is very vigorous. The local application of cold water—as in the cold sitz bath—is also of considerable therapeutic power when the principal aim is to divert an increased quantity of blood to the brain and the cord, as when the vasomotor mechanism is impaired and gravitation determines anemia of the nerve centers. According to the observations of Winternitz, the cold sitz bath increases the volume of the arm as registered by the plethysmograph; so that it possesses the power of increasing the distribution of blood in the upper parts of the body. We have here a reasonable explanation of the clarifying effect of the cold sitz bath on the mental haziness and dulness consequent on cerebral anemia from impaired vasomotor compensation.

"*Shower, Needle, and Douche Baths.*—The influence of temperature *per se* is greatly modified by the mechanical agency of percussion and vibration, so that when the water is divided into innumerable fine jets which impinge all over the surface of the body with a certain degree of force, or when it is applied in the form of the traveling douche accompanied by a vibratory form of massage, the vasomotor system is much more powerfully affected than by any form of still bathing, even though the water be charged with carbonic acid or saline matter. The therapeutic advantages of this form of bathing are very considerable, for it can be made to furnish all the tonic effects of cold bathing along with an agreeable temperature that may be adapted to individual requirements. A more intelligent appreciation of the curative value of this and of similar forms of tonic bathing now prevails at many health resorts, where in times gone by a course of bathing often simply meant soaking in hot water with the consequent impairment of the vasomotor mechanism. The massage, douche, and needle bath is the form of bathing best of all adapted to counteract the enervating effects of city life, with all its attendant worries and anxieties; and were it established in our large centers, it would, I am persuaded, prove to be a boon to many sufferers from nervous exhaustion, and would become even more popular and valuable than the Turkish bath.

"Carbonic acid and saline baths also belong to the stimulant form of bathing."

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**Picric Acid for Burns.**— French surgeons have recently been using a solution of picric acid for the first treatment of burns. It has been found that the pain which is caused by the burning of the skin can be almost immediately alleviated, or altogether removed, by painting the surface with a strong solution of picric acid.—*Medical Times.*

# BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE AND BACTERIOLOGICAL REVIEW, from original sources.]

**Relation of Streptococci to the Diphtheria Bacillus.**— Bonhoff (*Hygienische Rundschau*, 1896) has shown that mixed cultures of streptococci and Loeffler's bacillus are much more virulent than either the diphtheria bacillus, or the streptococci alone. It was particularly observed that nephritis occurred when toxins of pure cultures of streptococci were added to the diphtheritic cultures employed.

**The Origin of the Pigment Malaria.**— Sakharoff has recently shown, by experiments upon the blood of fowls, that the formation of granulations and vacuoles in the red corpuscles is due to decomposition of hemoglobin and hematin and of the albuminoid elements. By experiments upon guinea-pigs the author has established the fact that the granules of eosinophyles are identical with those observed in the nuclei of hematoblasts.

**Typhoid Bacilli in Urine.**— Semple (*Lancet*) has examined the urine of seven typhoid fever patients for the purpose of demonstrating the presence or absence of typhoid bacilli. He made cultures of the urine, and in six cases easily demonstrated the presence of typhoid bacilli.

**Serum Cure of Plague.**— Dr. Kitasato, of Japan, announces the discovery of a serum which is capable of curing the plague in a few hours. He also claims that the same serum will cure diphtheria, cholera, and leprosy.

**Formalin.**— Numerous carefully conducted experiments have demonstrated the great value of formalin as a disinfectant. Formalin has a very peculiar odor, but this quickly disappears from articles disinfected. It may be used in gaseous form, or in solution. A solution of formalin effectually prevents the growth of the most dangerous pathogenic microbes, such as the bacilli of anthrax, of typhoid fever, diphtheria, cholera, and such pus-forming germs as the staphylococcus pyogenes aureus.

In a one-per-cent. solution, formalin will kill nearly all pathogenic microbes in thirty minutes. A three-per-cent. solution kills all pathogenic microbes except those of anthrax in one minute. The bacillus of anthrax requires three minutes. A three-per-cent. solution of formalin containing a small per cent. of alcohol renders the hands completely sterile. Clothing, furniture, etc., may be completely disinfected in ten minutes, without injury, by spraying with a ten-per-cent. solution of formalin. Fecal matters may be almost immediately deodorized by a one-per-cent. solution. A weak solution of formalin is an excellent preservative of tissues. It is useful therapeutically as an application to the bowels, by which a sloughing is produced, causing a speedy separating of the dead from the living tissues.

**Identity of the Diphtheria Parasite in Man and Animals.**— M. Danilewski (*La Presse Medicale*, 1896) has recently called attention to a large number of observations made by him which point to the correctness of a theory which he announced a number of years ago, that the malarial parasites of man and lower animals are identical. He believes that Dimattei was led to dissent from this view by the fact that the pigeons which he studied were suffering from chronic malarial affection, in which form the disease is little susceptible to quinine, fever also being absent. Gratia has recently shown that the serum of Behring and Roux has no effect whatever upon the diphtheria of birds, from which he argues that the disease must be wholly distinct from the allied disease in human beings.

**Elimination of Micro-organisms by the Kidneys.**— A. Beidl and R. Kraus have, by carefully conducted experiments, recently shown that microbes introduced into the organism by injection into the veins appear in the urine within from five to twenty minutes, the urine appearing clear and free from albumin. The elimination is not uniform in character, however, the proportion varying from moment to moment; and as regards the kidneys, the elimination of bacteria through them seems to be increased by diuretic sub-

stances and by the injection of glucose. These experiments show that the elimination of bacteria may take place by the kidneys without rupture of the vessels of these organs. These investigators believe that the elimination is effected by a process of diapedesis.

**The Production of Biliary Calculi by Microbes.**— Experiments conducted by MM. Gilbert and Fournier, and recently reported to the Society of Biology (*La Presse Medicale*, February, 1896) show that various organisms are active in the production of biliary calculi, as the typhoid bacillus and other organisms which infest the alimentary canal, but that the colon bacillus plays by far the largest rôle in the production of biliary calculi, both in human beings and lower animals.

**The Influence of Electricity upon the Toxins of Bacteria.**— MM. d'Arsonval and Charrin have lately shown that the electrical current of high frequency may be applied to an inoculated animal in such a way as to render harmless the toxins of the bacillus pyocyanous and Loeffler's bacillus, but so to attenuate these toxins as to render them useful as vaccines. This observation is an exceedingly interesting one, and we hope the investigators will continue their experiments, and develop some practical method whereby currents of high frequency may be used therapeutically in the treatment of diphtheria. The well-known fact that these currents can be applied to the body without the production of sensation or any unpleasant effects, taken in connection with these experiments, gives ground for hope that in alternating electrical currents of great frequency we may have a valuable remedy in the treatment not only of diphtheria but of other infectious maladies.

**The Bacteriology of Malignant Tumors.**— Peterson, of Heidelberg, reports (*Medical Week*) that in a clinic of Professor Czerny experiments have been made with both sterilized and filtered cultures of the streptococcus pyogenes and the micrococcus prodigiosus, and with the serum of animals inoculated with the cultures of both these germs. The result of these experiments has been, on the whole, unsatisfactory. In one case, a cancer which had been comparatively inactive, developed into general carcinomatosis a short time after the injection. In one case a sarcoma diminished in size sufficiently to permit its extirpation. Dr. Senger, of Crefeld, reported at the General Congress of Surgery, held in May, 1896, a case of the cure of sarcoma by an attack of erysipelas.

**Bacteria of the Vagina.**— Dr. Chas. Jewett has been studying the bacteria of the vagina in the newly born, and summarizes his conclusions as follows: —

1. The vagina remains sterile for at least two hours after birth. From this time until the third day micro-organisms may or may not be detected; the number of cases where bacteria are found, gradually increases as time goes on, and the bacteria-free secretions diminish. After the third day micro-organisms are always present in the secretion of the vagina.

2. Pathogenic organisms are relatively frequent; staphylococcus pyogenes albus and aureus are observed in four per cent. of the cases; streptococci, in 14.6 per cent. of the cases.

**Antitoxic Serum in Smallpox.**— M. and A. Bécleré recently communicated to the Academy of Medicine, Paris, the result of observations made by them, which indicate the probability that they have discovered a means of treating smallpox by an antitoxic serum with the same degree of success that has attended the treatment of diphtheria. The serum is obtained from the blood of vaccinated animals, and is used in the same manner as the antitoxic serum which is employed in the treatment of diphtheria.

**Typhoid Germs in Ice.**— The military officers at Rennes (*Medical Press and Circular*) have recently suffered from a typhoid epidemic, which has been traced to the ice which was used to cool the champagne at a banquet. The ice had been taken from a neighboring river at a point where the town sewers empty.

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## THE FUNCTIONS OF THE STOMACH.

THE great progress which has been made in the study of the chemical processes of digestion has not been attended by a corresponding progress in the therapeutics of indigestion, probably for three reasons: —

1. Because too much reliance has been placed upon pharmaceutical preparations as a means of correcting the morbid conditions of the stomach.

2. Because of insufficient attention paid to other functions of the stomach than those concerned with the chemical processes involved in the liquefaction of the food.

3. Because of neglect to consider the fact that proper liquefaction of food in the stomach requires the conversion of the starch by salivary digestion as well as the solution of proteid matters by the gastric juice.

Indeed, from numerous observations made by the writer, the conclusion seems just that the failure of proteid digestion in the stomach is much less likely to give rise to disordered digestion than the imperfect digestion of starch. It is probably for this reason that an exclusive meat diet, the milk diet, and other dietaries excluding starch have won so much reputation in the treatment of chronic indigestion. These exclusively nitrogenous dietaries are most successful in cases of hyperpepsia, although these are the very cases in which, from a physiological standpoint, they would seem to be least indicated.

It is in hyperpepsia also that the inconveniences arising from the indigestion of starch are most likely to occur. The fermentation of starch is an acid fermentation. This may occur in connection with hyperpepsia, while the fermentation of proteids is hindered by the presence of an abundant quantity of hydrochloric acid in the stomach. Hence we find proteid fermentation most frequent in hypopepsia, and acid fermentation most frequent in hyperpepsia.

Professor Moritz, of Munich, in a recent lecture made a number of interesting points, some of which are almost revolutionary in their significance. They may be summarized as follows: —

1. The digestion of animals — at least, dogs — may be maintained after the removal of the stomach, as is shown by the experiments of Czerny and Kaiser. This agrees with the observations of Noorden, Ewald, and others, upon human beings, to the effect that good health may be maintained notwithstanding the existence of almost complete apepsia, the liquefaction of food in these cases depending upon the action of the saliva in converting the starch into dextrin and sugar. This change is often found to be complete in cases of apepsia, according to the writer's observations.

2. Von Mering, Moritz, and Brandl have shown by experiments that the stomach cannot be regarded as an organ for absorption, except for alcohol. Since alcohol is an artificial and not a natural product, and never intended by nature to serve as a food, it would appear from these experiments that the stomach cannot be regarded as an organ of absorption, except with relation to morbid and toxic substances.

3. The result of this fact is that the food-substances of the stomach are kept in a diluted condition, and thus prepared for easy entrance into the intestines, and

for ready absorption after their passage from the stomach into the lower portion of the digestive tract. Röhmann has observed that concentrated solutions of sugar are not readily absorbed in the intestine, and that solutions having a strength of .5 per cent. are most readily absorbed.

4. Quincke has shown that equalization of temperature takes place readily in the stomach, and that the stomach is not much disturbed by considerable extremes in temperature, although this is not true of the intestine. Bunge has shown the importance of the antiseptic function of the stomach through the influence of hydrochloric acid. We showed in a paper recently read before the American Academy of Medicine that the stomach itself is an organ of antisepsis, independent of the hydrochloric acid which it contains. Professor Moritz goes a little further, and claims for the stomach that its chief purposes are: (1) To serve as a reservoir in which the food is liquefied and its supply to the intestine regulated, thus favoring complete digestion and absorption; (2) Protection of the stomach against bacterial, chemical, and thermal causes of injury by disinfection, by dilution, and by the modification of temperature.

The paper read by Professor Moritz was published in the *Münchener Med. Wochen.*, No. 49, 1895.

## MOVING TOWARD THE LIGHT.

THE modern developments in physiological chemistry and bacteriology, as well as the accumulated evidence of experience, has convinced the great majority of skilled and well-educated physicians in the ranks of homeopaths, that the sectarian bounds of their school were too small for the exercise of the practise of rational medicine; and numerous attempts have been made to enlarge the boundaries set by Hahnemann, the founder of this school of medicine.

This movement has finally gained such proportions that there was recently organized at Buffalo a medical society known as the American Association of Physicians and Surgeons, made up of qualified members of the profession of different schools, the purpose of which is to break down the bars of sectarian medicine, and make a platform large enough to admit any intelligent or qualified practitioner, irrespective of his sectarian antecedents. So far as its medical creed is concerned, the regular profession has long ago abandoned sectarianism, and ceased to subscribe to the principle of *contraria contraris curantur* attributed to it by Hahnemann.

We are glad to see this movement. It is in the right direction, and it is the sincere hope of the writer that sometime in the future there may be only two recognized classes of physicians; viz., those who are practising medicine on a rational and physiological basis, and those who are pursuing blindly irrational methods.

The long fight among the different schools of medicine has been based upon differences of opinion upon the so-called action of drugs; but intelligent physicians are finding out (many long ago made the discovery) that in the relation of the human body and drugs, it is the cells of the body which are active, and not the drugs. The body acts upon the medicine, not the medicine upon the body. Modern developments in hydrotherapy, electrotherapy, massotherapy, and the various branches of physiological medicine, including dietetics, have left comparatively little room for pharmaceutical products, so it is exceedingly foolish to still maintain the old quarrel about big doses and little doses, when doses of any sort have so small a part to play in the rational treatment of disease. The high-potency delusion seems about dead.

## THE TRAMP MALADY.

THE disposition to wander incontinently from place to place seems to be a sort of disease. Certain persons seem to be afflicted with the tramp temperament, or cachexia; they cannot remain long in one place,— or, at least, do not,— but are continually moving on, perhaps partially from compulsion, as there seems to be, everywhere, a disposition to invite the tramp to pass on to some other locality.

As a rule, tramps are men of little education or men who have made a failure in life, and who, if they have trades, have acquired so little efficiency in their chosen occupations that their labor is desirable only when there is a scarcity of unemployed persons of that trade. Tramps are sometimes persons who have once had homes and families, but, through death or other circumstances, have been separated from them, and are, so to speak, turned loose in the world without anchorage anywhere, and without any one whom they can call a friend, or a place which they can properly call home.

There seems to be an increasingly large number of persons who, from one cause or another, have acquired the tramp habit, and are continually moving from one place to another, obtaining a precarious living through exposure and the uncertain supply of food, raiment, and lodging.

That the tramp evil has existed for hundreds of years is evidenced by the mention of "vacabundes" and "beggars" in the history of the reign of Henry VIII of England, to whom they gave much trouble.

All sorts of methods have been adopted to suppress the tramp evil, such as whipping, branding with hot irons, putting in the pillory, placing in chains, in fetters, in prisons, lopping off the ears, etc.; but all to no purpose. The Russian government has recently adopted, in Moscow and St. Petersburg, the plan of keeping able-bodied tramps and beggars in a large workhouse, and supplying them with employment for which they are paid ten cents a day, sending all who are sick to the hospital, where they receive proper treatment. This method seems much more sensible than that which is adopted in the United States, which consists simply in arresting the tramp and shutting him up in jail, this being in a great majority of cases exactly what he wants, as it insures him comfortable quarters during the cold weather, and plenty to eat and drink.

The writer would be glad to see organized in every large city and in other localities where tramps abound, a tramps' lodging-house, which might be called "The Working Man's Home," to give it an air of respectability. Such a place should furnish clean beds and a low rate for lodging — say ten cents a night — and should have connected with it free baths, free laundry, a penny lunch-counter, a reading-room, a lecture-room, respectable toilet-rooms, all being conducted in a kindly spirit, so as to make the wanderers feel at home.

Another important accessory would be an industrial department, in which every man would be required to work enough to pay for his lodging when not able to pay for it in money. There are various occupations in which skilled labor can be employed, such, for example, as weaving mats and rag carpets with a hand-loom, bottoming chairs, dressing over furniture, making kindling, etc. From what the writer has seen of the results of such work in Chicago and other large cities, he believes that much might be done to lessen the number of tramps by showing a friendly interest in these poor, depressed souls, and encouraging them to rise to a higher plane of life.

**Neurasthenia not a Disease.**— The writer has long maintained that the classification and description of neurasthenia

in our medical text-books as a distinct malady, and its general treatment upon this basis, by physicians, is wholly unscientific and erroneous. Neurasthenia is a condition which is indicated by a special group of symptoms, and must itself be regarded as symptomatic rather than a pathological entity requiring a therapeutic agency to be immediately addressed to it.

Referring to a form of neurasthenia due to albuminuria, Dr. Pierre Marie, in a recent lecture delivered at the Hotel Dieu, Paris (*Medical Week*), very wisely remarked as follows: —

"The average medical man is apt to be content with appearances, and announces to his patient in a reassuring tone that it is nothing but a simple neurasthenia, which a few douches will quickly dispose of. In reality, however, he makes a grave mistake in forgetting that neurasthenia is not a disease, but a condition of the nervous system which may be the result of the most varied causes. Neurasthenia without any other qualification is not a diagnosis; for, as I have repeatedly stated, it is necessary also to indicate the determining cause. There may be neurasthenia by mental depression, excessive brain work, disturbed nutrition (cancer, etc.), neurasthenia due to lesions of the nervous system or of visceral origin, etc. It is of very frequent occurrence in diabetes and albuminuria, and we are therefore in duty bound in a case of neurasthenia to examine the urine, more particularly for albumin."

This is a rational method of dealing with neurasthenia. The cause must be considered rather than the condition itself. Remove the cause, and the neurasthenia quickly disappears. Rational physicians are coming more and more to consider the patient rather than his disease, in the application of remedies. When the eye is focused too closely upon the malady of the patient, the best interests of the patient himself may be forgotten. The writer has known cases in which diseases have been cured to the actual detriment of the patient; as a skin disease by the prolonged administration of large doses of arsenic, resulting in albuminuria, or constipation by the continuous use of cathartics or laxative mineral waters, to the total destruction of the patient's digestion.

"Neurasthenia" is a splendid term for hiding ignorance. Without some qualification, it is a word which never should appear as a diagnosis in a physician's case-book.

**The Unwisdom of Hypnotism.**— We agree with Dr. Hart, of the *British Medical Journal*, that the hypnotic state is a pathological condition. Hypnotism succeeds well only in certain susceptible persons.

While observing the experiments of Professor Charcot at the Hospital Salpêtrière, we noted that those persons who were really good subjects for hypnotism, and whom the professor brought before the class for demonstration, were evidently persons of weak mental constitution,— persons whose volitionary powers were deficient. Hypnotism is a complete success only when the subject has received a certain mental training whereby his volitionary control is still further reduced, and he is brought into a state in which he becomes more and more subject to impulses, and possessing less and less inhibitory power as he becomes a better subject for hypnotic influence.

The class of persons who are susceptible to benefit by suggestion through hypnotism are the very ones who need to have the will strengthened, and to be taught to apply a greater power of control over their impulses, rather than the reverse; hence the influence of hypnotism must be decidedly damaging, weakening the will, and aggravating the pathological condition which already exists.

All the real good that can be accomplished by hypnotism may be brought about by mental therapeutics, or rational psychological treatment without hypnotism. A course of mental training whereby the will may be strengthened, volitionary power increased, ability to suppress impulses developed, and the general health and vigor improved, will accomplish, in every case, all that can be done by hypnotism, and far more.

In the writer's opinion there is no place for hypnotism in scientific thera peutics.

**Eating When Fatigued.**— Every one should know that to eat when tired is to place upon the digestive organs a burden which they are wholly unable to carry. When the body is in a state of fatigue, the digestive organs are unable to perform their natural functions; the glands of the stomach will not form gastric juice; the saliva is deficient in quantity; and the whole digestive apparatus is incapable of doing efficient work. When exhausted, one should rest before eating. If a faint or "all-gone" sensation is experienced, relief may be obtained by drinking a glass of hot water or diluted fruit juice of some sort.

**Horse Beef.**— Within the last few years a new use has been found for worn-out street-car and cab horses. In former days these wretched animals were conveyed o the bone-yard or to a rendering establishment, where their hides were preserved for conversion into leather, their hoofs for glue and calves'-foot jelly, and their bones for fertilizers. The great surplus of horses, with their low prices, has recently given rise to a new method of disposing of these worn-out animals; and they are now served up, as in Paris, in the form of sausage, steaks, and roasts. There are two large establishments in the United States which are wholly devoted to slaughtering and packing horses. One of these is located in Portland, Ore.; and the other is near Chicago. The horses cost about $1.75 each. Horse beef is largely used by the men employed on the great drainage canal now under construction from Chicago, it being sold at about three cents a pound. Large quantities of this commodity are shipped to Antwerp, where it brings four cents a pound. It is also stated that horse flesh is freely used for saloon free lunches.

**Enormous Doses of Subnitrate of Bismuth.**— Mathieu recently reported a case in which the patient, who was suffering from hyperpepsia, took more than two ounces of subnitrate of bismuth daily for twenty-four days. The hyperpepsia was not materially benefited, but the patient suffered no other ill effects than a slight constipation and pigmentation of the skin, which disappeared when the drug was discontinued.

**Music as a Hypnotic.**— Beschinsky, a Russian physician, has reported remarkable results from the employment of music as a hypnotic. The remedy succeeded with both children and adults. The instrument employed was a piano.

**Serum Treatment in Typhoid Fever.**— Börger reports a case of typhoid fever treated by the serum of immunized sheep. No very tangible results were observed.

**Photographing the Vocal Cords.**— Experiments made by Professor Hallock in photographing the vocal cords have shown that the pitch is raised, not by increase in the tension of the cords, but by rotation of the arytenoid cartilages, whereby the cords are shortened.

A RECENT investigation of the herd of cows supplying the San Francisco almshouse with milk, showed thirty-one out of thirty-four cows to be affected with tuberculosis.

# REVIEWS.

DIAGNOSIS AND TREATMENT OF DISEASES OF THE RECTUM, ANUS, AND CONTIGUOUS TEXTURES.— Designed for practitioners and students. By S. G. Grant, M. D., professor of diseases of the rectum and anus, University and Woman's Medical Colleges; lecturer on intestinal diseases in the Scarritt Training-School for Nurses; rectal and anal surgeon to All-Saints, German, Scarritt's Hospital for Women, and Kansas City, Fort Scott, and Memphis Railroad Hospitals, to East-Side Free Dispensary, and to Children's and Orphans' Home, Kansas City, Mo.; member of the American Medical Association, National Association of Railway Surgeons, the Mississippi Valley, the Missouri Valley, and the Missouri and Kansas State Medical Associations, etc.: with two chapters on "Cancer" and "Colotomy" by Herbert William Allingham, F. R. C. S., Eng., surgeon to the Great Northern Hospital; assistant surgeon to St. Mark's Hospital for Diseases of the Rectum; surgical tutor to St. George's Hospital, etc., London. One volume, royal octavo, 400 pages. Illustrated with 16 full-page chromo-lithographic plates and 115 wood-engravings in the text. Extra cloth, $3.50 net; half Russia, gilt top, $4.50 net. The F. A. Davis Co., publishers, 1914 and 1916 Cherry Street, Philadelphia; 117 W. Forty-second Street, New York; 9 Lakeside Building, Chicago.

This work is certainly worthy of high commendation. The author gives evidence of having had a large experience in the disorders of which the work treats, and we think most specialists who have had large experience in the treatment of rectal disorders will find little occasion to dissent from the positions taken by him. We do not, however, quite agree with his view of the Whitehead operation, an operation which is eminently successful when properly performed. We know of only one good operation for hemorrhoids, which this author seems to have overlooked; namely, the use of the snare and cautery. This method is decidedly preferable in a case of pedunculated hemorrhoids and polypi located high up in the rectum. The illustrations of the work are most excellent, and will be exceedingly helpful to the inexperienced surgeon.

In point of excellence of presswork, paper, binding, and particularly the handsome chromo-lithographic plates, it is unsurpassed among modern medical works, and its very moderate price renders it easily obtainable by every physician and student.

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COLOR-VISION AND COLOR-BLINDNESS.— A Practical Manual for Railroad Surgeons. By J. Ellis Jennings, M. D. (Univ. Penna.), formerly clinical assistant to the Royal London Ophthalmic Hospital (Moorfields); lecturer on ophthalmoscopy and chief of the eye clinic in the Beaumont Hospital Medical College; ophthalmic and aural surgeon to the St. Louis Mullanphy and Methodist Deaconess Hospitals; consulting oculist to the Missouri, Kansas, and Texas railway system; fellow of the British Laryngological and Rhinological Association; secretary of the St. Louis Medical Society. Illustrated with one colored full-page plate and twenty-one photo-engravings. Crown octavo, 110 pages. Cloth, $1 net. Philadelphia: The F. A. Davis Co., publishers, 1914 and 1916 Cherry Street.

This little work gives complete information upon the subjects of which it treats, and is an exceedingly convenient manual, by the study of which any intelligent person may render himself competent to make a proper examination with reference to color-blindness. The subject of color-blindness is coming to be more and more generally recognized as an important one, and this work will be universally recognized as meeting a real want in the literature of medicine. Among the numerous useful medical works which are being brought before the profession by that enterprising publishing house, the F. A. Davis Company, there are very few which will prove of greater service and be more appreciated than this one.

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SYPHILIS IN THE MIDDLE AGES AND IN MODERN TIMES.— By Dr. F. Buret, Paris, France. Translated from the French, with notes, by A. H. Ohmann-Dumesnil, M. D., professor of dermatology and syphilology in the Marion Sims College of Medicine; consulting dermatologist to the St. Louis City Hospital, to the St. Louis Female Hospital; physician for cutaneous diseases to the Alexian Brothers' Hospital; dermatologist to Pius Hospital, to the Rebekah Hospital, to the St. Louis Polyclinic and Emergency Hospital, etc. This work comprises Volumes II and III of "Syphilis To-day and Among the Ancients," complete in three volumes. 12mo., 300 pages. Extra cloth, $1.50 net. Philadelphia: The F. A. Davis Co., publishers, 1914 and 1916 Cherry Street.

This work contains much that is interesting and curious. The author has certainly been indefatigable in researches in relation to his subject; but we are in greater need of literature whereby men may be taught how to keep themselves pure than of books which suggest that the authors must have run a muck rake through all the libraries of the past to find material for filling them. The book is not without value to the specialist in disorders of this sort, but we really cannot imagine how any good can come from its general circulation even in the medical profession, and, unfortunately, its circulation will not be confined to practitioners of medicine.

ESSENTIAL LESSONS IN HUMAN PHYSIOLOGY AND HYGIENE FOR SCHOOLS.— By W. E. Baldwin, M. D. The Werner School Book Company, Chicago, Ill.

This work of about 200 pages is printed on good paper and in clear type, and is well adapted to the purpose for which it is designed,— that of a school text-book. The subject-matter is clearly and concisely presented, and the alcohol and tobacco questions receive due attention. We are glad to note that the author takes a decided stand against the popular theory that alcohol somehow serves a useful purpose as a food. The work is a good one.

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THE HIGHER CRITICS CRITICIZED.— By Rufus P. Stebbins, D. D., and Rev. H. L. Hastings. Published by H. L. Hastings, 47 and 49 Cornhill, Boston, Mass.

So much has been said and written within recent years about the "higher criticism," that a work of the character of the one before us is certainly timely. The very term "higher criticism" enjoys to such an extent the advantage of scholarly authority that its mere mention is sufficient to cause a great number of people instantly to take off their hats and make a very low obeisance, metaphorically speaking, and to accept, almost without question, the conclusions to which these "higher critics" have arrived, no matter how much at variance they may be with the generally accepted views of Holy Writ, or what might be termed the common-sense interpretation of its language. The general tendency of the so-called "higher criticism" has certainly been to undermine faith in the authority of the Bible as a spiritual guide. Convince a boy that his mother's word is not to be relied upon at all times and under all circumstances, and you have destroyed, altogether, that mother's influence over her son, except so far as it may be exercised by force. The "higher critics" have long employed themselves most diligently as iconoclasts, and have certainly accomplished much in tearing down old-fashioned faith and confidence in the word of God; but what have they given us in place of that which they have destroyed? The authors of this work bring the "higher critics" to judgment in a masterly way. The work is destined to be the means of accomplishing great good, and ought to have a wide circulation.

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ELEMENTARY TECHNIQUE IN HISTOLOGY AND BACTERIOLOGY.— By Ernest B. Hoag, A. B., B. S., and H. Kahn, Phar. M. E. H. Colegrove & Co., Chicago.

This little work of 130 pages contains more exact, definite, and lucid information than any treatise on bacteriology which has been brought to our notice. The work seems to be in every way thorough and satisfactory, and as complete as could be desired for a work of the kind.

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ELECTRICITY AND ELECTROTHERAPEUTICS.— By E. J. Houston, Ph. D., and A. E. Kennelly, Sc. D. The W. J. Johnston Co., New York.

This work presents to the electrotherapeutist what has heretofore been lacking,— a treatise in which is found summed up and presented in an admirably lucid manner the whole subject of electrophysics as related to therapeutics. Every physician, before undertaking to apply electricity therapeutically, unless already thoroughly posted in the physics of electricity, should obtain a copy of this work and master it. The work is not only technically correct in physique, but interesting as well. It is fortunate for the profession that two gentlemen so eminent in electrophysics should have taken the trouble to prepare a handbook of this kind. The book is brought out in excellent shape by the publishers, the W. J. Johnston Co., and constitutes one of the numbers of a series of elementary technical works comprising the various uses of electricity in heating, telegraphing, lighting, running of machinery, etc.

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PREGNANCY, LABOR, AND THE PUERPERAL STATE.— By Egbert H. Grandin, M. D., consulting surgeon to the New York Maternity Hospital; consulting gynecologist to the French Hospital, N. Y., etc.; and George W. Jarman, M. D., obstetric surgeon to the New York Maternity Hospital; gynecologist to the Cancer Hospital, N. Y., etc. Illustrated with forty-one (41) original full-page photographic plates from nature. Royal octavo. Cloth, $2.50 net. Philadelphia: The F. A. Davis Co., Publishers, 1914 and 1916 Cherry Street.

Drs. Grandin and Jarman, the authors of this excellent treatise, have brought to their work an ample and well-digested experience, and have produced a volume which is, in many respects, unique. From a practical standpoint it is altogether the best work of the kind which has ever appeared. The excellent half-tone illustrations instantly impart through the eye information which could scarcely be communicated by a simple description, and thus render the work indispensable to all who wish to be up with the times in respect to the subjects treated. The paper and presswork are excellent. The publishers as well as the authors are to be congratulated on producing so useful and handsome a volume.

The Battle Creek Sanitarium

**LABORATORY OF HYGIENE.**

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GEO. H. HEALD, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
A. B. OLSEN, B. S., M. D., Pathologist.
W. A. GEORGE, M. D., Chemist.

**Monthly Résumé of Work Done.**

## A NEW METHOD FOR DETERMINING THE CAPACITY OF THE STOMACH AND THE AMOUNT OF RESIDUAL CONTENTS.

BY J. H. KELLOGG, M. D.

PHYSICIANS who have undertaken to make an exact study of the morbid conditions of the stomach by the aid of ordinary means of inquiry have long desired some way of determining accurately the size of the stomach and the degree of motor efficiency, or ability to empty itself of its fluid. Several methods have been devised by which the lower border of the stomach can be pretty accurately located, but it has heretofore been impossible to determine with any considerable degree of accuracy whether the descensus of the stomach is due, in a given case, to prolapsus of the organ or to dilatation.

A line of thought and experimentation started by an idea received from a French writer some months since has enabled me to develop what I believe to be an exact method for determining the volume of the fluid contents of the stomach a any given time, and also the actual capacity of the stomach in a given case. The test should be made with the patient fasting if the capacity of the stomach is the chief object of the examination. The requisites for the procedure are as follows: —

1. Two reservoirs, holding about two liters each, one of which should be graduated, both connected by a rubber tube and a Y connection with a stomach-tube of moderate size.

2. Half a liter of a solution of sodium iodide, containing about .020 grams of the iodide (Na I) in each 100 c. c.

3. Two or three liters of distilled water, and a graduated beaker for measuring the same.

Everything being in readiness, proceed as follows: —

1. Have the patient swallow 200 c. c. of the standard iodide solution. Have the patient agitate the diaphragm for thirty seconds, so as to mix the iodide solution with the stomach contents.

2. Withdraw from the stomach with the stomach-tube, a portion of its contents (50 to 100 c.c.). Place this solution in a glass marked A.

3. Retaining the stomach-tube in place, pass into the stomach from the graduated reservoir distilled water sufficient to fill the stomach, holding the reservoir at the height of the shoulder. Carefully note the amount. The stomach should be considered filled when the fluid ceases to flow from the reservoir. No attempt should be made to force more into the stomach by raising the reservoir, as this will result in forcing the fluid out along the side of the tube, or down into the lower intestine. When the stomach is filled, shut off the tube leading to the graduated reservoir, and pass the fluid out of the stomach by opening the stop-cock leading to the other reservoir. Pass the fluid out and in the reservoir two or three times by alternately lowering and raising it. This should not occupy more than two minutes. Withdraw 300 to 400 c.c. of fluid, placing it in a glass marked B, the amount to be carefully measured later.

4. Pass into the stomach 200 c. c. of the standard iodide solution or water. Pass out and in the stomach two or three times, then remove as much of the stomach fluid as can be conveniently withdrawn, and place in a glass marked C.

5. Determine the amount of iodine contained in each of the glasses, A, B, and C. By comparison with each other

and with the first solution and the quantities of standard iodide solution and distilled water introduced into the stomach, the quantities sought will be obtained.

QUANTITIES AND FORMULÆ.

$r$ equals 200 c. c. of sodium of iodide solution.

$q$ equals amount of distilled water required to fill the stomach.

$a$ equals first portion of fluid removed from the stomach.

$b$ equals second portion of fluid removed from the stomach.

$c$ equals third portion of fluid removed from the stomach.

$n$ equals amount of iodine in each 100 c. c. of the standard iodide solution.

$n'$ equals iodine in 100 c. c. of $a$.

$n''$ equals iodine in 100 c. c. of $b$.

$n'''$ equals iodine in 100 c. c. of $c$.

$x$ equals the amount of fluid contained in the stomach at the beginning of the experiment.

$y$ equals the capacity of the stomach.

FORMULÆ.

$\frac{n \times r}{n'} - r = x$, contents in cubic centimeters.

(1) $\frac{n \times r}{n'} - a + q = y$, capacity in cubic centimeters.

(2) $\frac{n \times r}{n''' - n''} - r + b = y$, the capacity of the stomach.

---

A little study of the above formulæ will make very clear the principle upon which this method rests. In the formula for obtaining $x$ (the residual contents of the stomach), we multiply the number of milligrams per 100 c. c. contained in the standard solution (20), by the quantity of the solution introduced (200), and divide the result by the number of milligrams of iodine found in $a$, the first portion of fluid removed from the stomach after the addition of 200 c. c. of the standard iodide solution. (Of course any other desired quantities could be used, provided the quantity of iodide of sodium employed is sufficient for accurate estimation.) From the result obtained, we must subtract $r$, the amount of standard solution introduced (200 c. c.), to give $x$, the amount of fluid contained in the stomach at the beginning of the experiment. Placing the known quantities in place of $n$ and $r$, the formula will stand as follows: —

$\frac{20 \times 200}{n'} - 200 = x$, contents of stomach.

Now, by the addition of a sufficient quantity of water to fill the stomach, we have data by comparison of which may be estimated the capacity of the stomach. The fraction $\frac{n \times r}{n'}$, $\left(\frac{20 \times 200}{n'}\right)$, gives us the contents of the stomach before the first sample of fluid ($a$) was removed. Subtracting $a$ and adding $q$, the quantity of water required to fill the stomach, gives us $y$, the capacity of the stomach in cubic centimeters. This operation is represented in formula 1.

Now, removing a quantity ($b$) of the fluid contained in the filled stomach, and replacing it by 200 c. c. of the iodide solution ($r$), and then removing another sample of the stomach contents ($c$) and comparing the amount of iodine found in this second dilution with that found before, we have the means of determining the amount of fluid left in the stomach after the withdrawal of the second portion of fluid, $b$. By carefully measuring $b$ and adding to it the quantity left behind, as determined by comparison of the amount of iodine contained in the portions $b$ and $c$, we have a second means for determining $y$, the capacity of the stomach. This operation is expressed in formula 2.

We thus have two different methods of determining the capacity of the stom-

ach. The first depends upon the estimation of the contents of the partially filled stomach and the measurement of the amount of fluid required to fill the stomach. Adding these two amounts together gives the stomach capacity. The second method depends upon the estimation of the stomach contents after the stomach has been filled and a portion withdrawn, care being taken to measure the portion withdrawn. Then, by adding the amount determined for the stomach contents to the amount withdrawn from the stomach, we have a second determination of the capacity of the stomach. There is, of course, an element of error in the first method, in the fact that some portion of the fluid passed into the stomach may escape into the intestine. The second method, however, is practically free from this objection. By comparison of the results obtained by the two methods, we have the means of determining whether the pylorus is well closed, or whether it is relaxed.

In the following case the close approximation of the two quantities found for $y$ show not only the accuracy of the method, but also the fact that, in this particular case at least, the pylorus was well closed, and did not, at least within the time occupied by the procedure (which was only six minutes), discharge any of its contents into the intestine. The subject, a young man of about twenty-two years of age, was apparently in good health, and did not suffer from indigestion, and gave no evidence of any abnormal condition whatever pertaining to the stomach. The test was made by one of my laboratory assistants, a student of medicine, July 21, 1896, in the morning, before the patient had taken either food or drink, and the following figures were obtained: —

$r = 200$ c. c.
$q = 1800$ c. c.
$a = 70$ c. c.
$b = 188$ c. c.
$c = 175$ c. c.

$n = 14.5$ c. c. (burette reading) or .0493 gms. I.
$n' = 11.5$ c. c. " " or .0391 " "
$n'' = 1.1$ c. c. " " or .00374 " "
$n''' = 1$. c. c. " " or .0034 " "

$$\frac{14.5 \times 200}{11.5} - 200 = 52.1 \text{ (x)}$$

$$\frac{14.5 \times 200}{11.5} - 70 + 1800 = 1982.1 \text{ (y)}$$

$$\frac{1 \times 200}{1.1 - 1} - 200 + 188 = 1988. \text{ (y)}$$

$x = 52.1$ c. c. residual contents.
(1) $y = 1982.1$ c. c. capacity.
(3) $y = 1988$ c. c. capacity.
Time, six minutes.

It will be noted that the difference in the stomach capacity as determined by the first and second formulæ is but 6 c. c., or one fifth of an ounce, an amount of error not worth noting. The contents of the stomach in this case was practically two liters.

Several precautions must be observed in the employment of this method: —

1. The operation must be done quickly, the time occupied not being over four to six minutes. With everything in readiness, this gives ample time for the entire procedure.

2. The patient should be somewhat accustomed to the use of the stomach-tube by previously passing it a few times, so that gagging and retching from fear and nervousness may be eliminated.

3. The temperature of the solution should be that of the body, to avoid stimulating muscular movements on the part of the stomach.

4. The chemical estimations should be made with extreme accuracy. Indeed, the whole procedure must be executed with great precision, accuracy, and celerity.

5. Care must be taken to eliminate air or gas in the stomach as a source of error. By carefully passing the stomach-tube for withdrawal of the first portion, $a$, whatever gas there may be in the stomach will escape as soon as the tube enters the organ. A few seconds should be allowed for this, then the tube passed farther in, and a portion of the contents si-

phoned out. While the tube is full and the siphoning in progress, the tube should be pinched, then the connection should be quickly made with the injecting apparatus, the same having been previously adjusted so that the tubes will be completely filled with water. By exercising due care, no air will be forced into the stomach.

I am collecting data, by making a series of estimations of the capacity of the stomach in a sufficient number of healthy individuals to enable me to find the average size of the healthy stomach. The size of the stomach will, of course, naturally differ with the size of the individual; hence, for fair comparison, it will be necessary to determine the proper stomach capacity for individuals of different heights and to establish a stomach-capacity-height coefficient.

From the observations thus far made, I believe that the capacity of the healthy stomach should be about 1 c. c. for each millimeter of height. The height rather than the weight should be chosen as the standard for comparison; for the height is a fixed quantity in the adult individual, while the weight is constantly varying. I therefore propose for the coefficient of stomach capacity the unit obtained by dividing the stomach capacity in cubic centimeters by the height in millimeters. This gives for the case the details of which are given above, a stomach-capacity coefficient of 1.25.

In another case, that of a healthy young man aged twenty-seven years, height sixty-seven inches, the following figures were found: —

Residual contents ($x$), 32 c. c.

Capacity of the stomach, as determined by the first formula ($y$ [1]), 2007 c. c.

Capacity of the stomach as determined by the second formula ($y$ [3]), 1940 c. c.

In this case it appears probable that a small amount of fluid, 67 c. c., or a little more than two ounces, escaped from the stomach through the pylorus during the procedure.

In practise it is found that the addition of distilled water, as required by formula 3, produces so diluted a solution of iodine that it is difficult to estimate the amount accurately. On this account it is better to use the standard solution of iodide of soda, as required in formula 2, for the determination of $y$ for the stomach capacity.

As a means of determining the limit of accuracy of this method, I have had my assistant apply it to two flasks, one of which contained an unknown quantity of fluid, the other, an unknown quantity of distilled water. The results were as follows: —

FLASK I.

$r$ — 200 c. c.
$s$ — 200 c. c.
$q$ — 1930 c c.
$a$ — 86 c. c.
$b$ — 291 c. c.
$c$ — 219 c. c.
$n$ — .0765 gms. iodine.
$n'$ — .068 " "
$n''$ — .00595 " "
$n'''$ — .0134 " "
$x$ — 25 c. c., contents; actual contents, 25 c. c.
(1) $y$ — 2069, capacity; actual capacity, 2078 c. c. — 9 c. c.
(2) $y$ — 2091 capacity; actual capacity + 13 c. c.

As will be noticed, the method determined with absolute accuracy the contents of the flask which, together with its capacity was unknown to the experimenter until after the procedure was completed. The first formula for $y$ gives the capacity for a two-liter flask as 9 c. c., or a little more than two drams, less than the actual capacity. The determination of $y$ by the second formula gives a capacity of 13 c. c., or three drams too large.

From these figures it is apparent that the method is amply accurate for practical purposes, and that it affords a method whereby it is possible to determine with certainty between prolapse and dilatation of the stomach, and to measure

the degree of variation in the size of the stomach in either direction.

By the same method it is possible to determine the rate at which fluid leaves the stomach after its introduction, and other facts respecting the motor activity of the stomach,— a line of investigation which I am pursuing with much interest.

## REPORT OF EXAMINATION OF BLOOD.

FOR JUNE.

| Blood Count. | Men. | Women. | Total. |
|---|---|---|---|
| Over 5,000,000 | 19 | 0 | 19 |
| Between 4,500,000 and 5,000,000 | 37 | 15 | 52 |
| " 4,000,000 " 4,500,000 | 16 | 49 | 65 |
| " 3,500,000 " 4,000,000 | 1 | 8 | 9 |
| " 3,000,000 " 3,500,000 | 2 | 2 | 4 |
| Totals | 75 | 74 | 149 |

| Hemoglobin. | Men. | Women. | Total. |
|---|---|---|---|
| 100 per cent. | 34 | 13 | 37 |
| 93 " " | 40 | 49 | 89 |
| 86 " " | 3 | 13 | 16 |
| 78 " " | 3 | 1 | 4 |
| 71 " " | 1 | 0 | 1 |
| 63 " " | 1 | 1 | 2 |
| Totals | 72 | 77 | 149 |

**Gastric Laboratory Report for June.**— Regular chemical analysis of the stomach fluid was made in 157 cases; experimental analyses, 26.

The cases were from the following States and countries: From Michigan, 58; Ohio, 22; Indiana, 2; Illinois, 14; Texas, 9; Minnesota, 7; Pennsylvania, 6; New York, 4; Iowa, 3; Missouri, 3; Nebraska, 3; Kentucky, 2; Tennessee, 2; Montana, 2; Wisconsin, 2; Massachusetts, 1; Louisiana, 1; Alabama, 1; Arizona, 1; Connecticut, 1; Ontario, 2; England, 1. Total, 157.

**Microscopical Examination of Sputum for June.**— Number of examinations made, 42; new cases, 32; number of specimens in which tubercle bacilli were found, 14.

Tubercular germs were found in 8 cases, from the following States: Michigan, 3; Missouri, 1; Virginia, 1; Ohio, 1; Illinois, 1; Canada, 1.

**Urinary Laboratory Report for June.**— Number of specimens examined, 329; number of cases, 253. Number of specimens in which albumin was found, 19; pus, 67; blood, 3; sugar, 5; bile, 7; casts, 3. Number of specimens examined for toxicity, 22; number of cases, 19.


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# PUBLISHERS' DEPARTMENT.

A NEW FOOD FOR DIABETICS.— Since the discovery that a flesh diet is dangerous for diabetics, often giving rise to diabetic coma, numerous attempts have been made to find a suitable substitute.

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Nuttose supplies carbonaceous food in the form of fat, in a state of perfect emulsion, and the proteids in a state of extremely fine division, so that it quickly dissolves in the digestive fluids. It is one of the most easily digestible of foods.

Nuttose closely resembles beef or mutton in appearance and flavor, can be prepared in all the different ways in which meat is prepared, and is a delicately flavored, highly relishable food. It is, on this account, greatly superior to the various gluten preparations which have heretofore been offered as the only alternative for a meat diet.

Nuttose is certain to prove a godsend to thousands of diabetics. It is furnished at a very moderate price, less than any reliable gluten preparation. Its nutritive value, in the form in which it is furnished, is twice that of beef, mutton, or chicken. It is put up in one and one-half pound cans, hermetically sealed, and will keep indefinitely.

For a nice sample, address Sanitas Food Co., Battle Creek, Mich.

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THE AMERICAN ELECTRO-THERAPEUTIC ASSOCIATION.— The Sixth Annual Meeting of the American Electro-Therapeutic Association will be held on Tuesday and Wednesday, Sept. 29 and 30, and Thursday, Oct. 1, 1896, in Allston Hall, the Studio Building, Clarendon Street, near St. James Avenue, Boston, Mass.

The Brunswick Hotel, corner Boylston and Clarendon Streets, will be the headquarters of the Association during the meeting. Terms reduced to four dollars per day for Fellows and their friends. The Copley Square Hotel, corner Exeter Street and Huntington Avenue, terms reduced to three dollars per day, is also located in close proximity. For rooms, etc, apply either to the proprietors, or to Dr. W. H. White, No. 222 Marlborough Street, Boston, Mass., who, as the Vice-Chairman of the Committee of Arrangements, will reserve rooms.

Professor A. E. Dolbear, Tufts' College, Mass., is the Chairman of the Committee of Arrangements.

Dr. W. H. White, 222 Marlborough Street, Boston, Mass., is the Vice-Chairman of the Committee of Arrangements.

Dr. Frederick H. Morse, Melrose, Mass., is the Chairman of the Committee of Exhibition.

The next annual meeting promises to be a greater success than any former one. Great interest is shown in all quarters; a large attendance is promised. Many candidates of national reputation are proposed for membership, so that the amendment to increase the limit of members becomes a necessity. The best talent has already announced papers, a larger number than ever before, at this early date,—material almost sufficient to make a program for the session of unusual interest. There will be two discussions of importance in electro-therapeutics, interesting reports of all standing committees, several scientific lectures on the first evening, with demonstrations and stereoscopic views (including the Roentgen X-Rays, and electric principles in the treatment of diseases), given by eminent talent.

The Committee of Arrangements has surprises in store for the social element in receptions and excursions.

The exhibition promises to be a good feature, and of more than usual interest.

The fifth annual volume of "The Transactions of the American Electro-Therapeutic Association" is now on press, and will be ready for delivery about the end of July, 1896; illustrated, cloth bound, gilt lettering, octavo, about three hundred pages.

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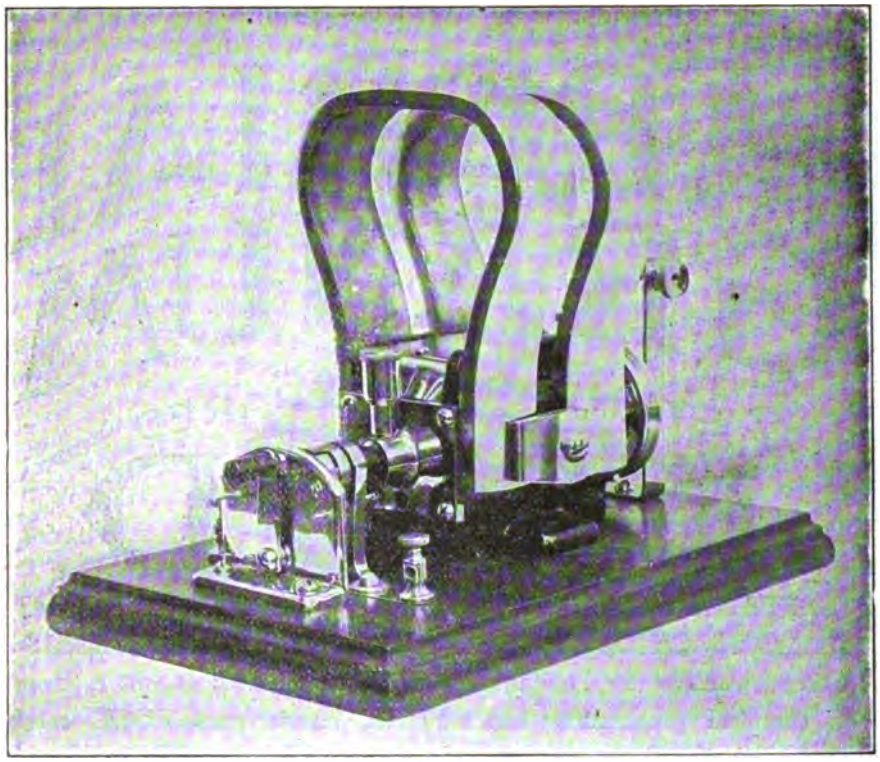

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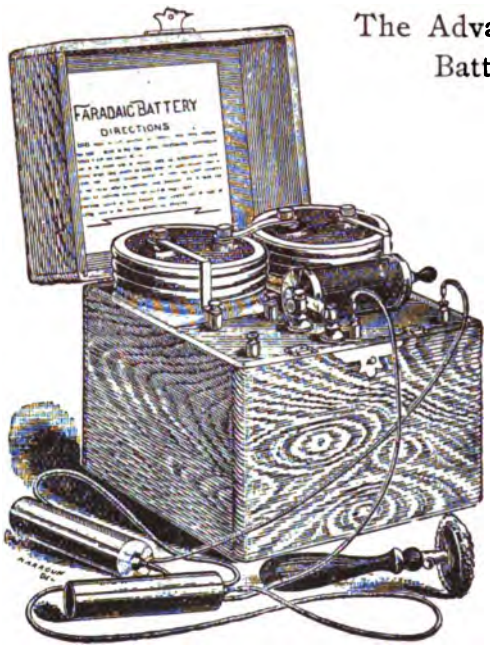


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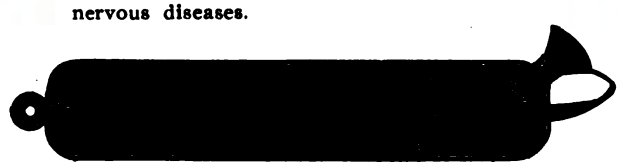

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VOL. V. BATTLE CREEK, MICH., U. S. A., AUGUST, 1896. NO. 8.

# ORIGINAL ARTICLES.

## MECHANICAL EXERCISE.

BY J. H. KELLOGG, M. D.

(Concluded.)

TRUNK-EXERCISING APPARATUS.— Figs. 17 and 18 represent forms of apparatus which are of substantial service in exercising the muscles of the trunk. Although the results obtained are different, the principle of both machines is the same, and is based upon the fact that the body involuntarily seeks to maintain its equilibrium.

*Active-passive Rotation of the Hips.*— Fig. 17 is an apparatus so constructed as to cause a seat to revolve in such a manner that its plane shall continually change, thus inducing the patient, when seated upon the apparatus, to contract the muscles of the trunk in maintaining his equilibrium, the body being steadied by the hands. There is thus secured a complete and perfect rotation of the hips. This is a most excellent form of exercise for persons with weak trunk muscles, which is the condition of most women who come under the care of the gynecologist, as well as of a large share of the cases of nervous dyspepsia in both men and women. This apparatus has the advantage over the other forms of gymnastic apparatus in that it brings the muscles into action automatically, as in walking, and thus secures a more complete and natural movement of the muscles of the trunk. The first applications with this apparatus should be brief,— not more than one or two minutes,— as the muscles of the trunk are brought into such vigorous action that they are likely to be overtaxed, especially in feeble persons. The apparatus may be used either with or without power attachment, but is usually employed without.

*Trunk Flexion.* — In the apparatus shown in Fig 18 the movement is a tilting of the seat from side to side. It is used in two positions : (1) with the patient sitting parallel with the line of movement ; (2) with the patient sitting at right angles to the line of movement. In the first position, the patient is induced to make alternate flexion of the trunk forward and backward ; in the second position, the patient flexes the trunk from side to side.

The use of this apparatus is indicated in the same class of cases as the preceding. Its action is less powerful, and consequently it is especially adapted to feeble patients at the beginning of a course of treatment, and as an introduction to the more vigorous movements. The action of this apparatus being less energetic than the preceding, the applications may be somewhat longer — two or three minutes at first, and longer after the patient becomes accustomed to them.

*Mechanical Respiration.*— In Fig. 19 is shown an apparatus by means of which artificial respiration may be mechanically administered. In its use the patient is seated upon a stool, the arms being placed over movable rests, which fall in the axillæ. The back is supported by a padded rest placed between the shoulders. When the machine is set in motion, the shoulders are lifted upward and backward in such a way as to expand the chest in an efficient manner, producing a strong inspiratory movement quite independent of any effort on the part of the patient. The effect is to correct the condition known as flat or hollow chest, and to give flexibility to the chest walls when they have become rigid in consequence of insufficient use. This apparatus is in

part modeled after a similar arrangement by Zander, but several improvements have been added; among others, is a device for raising the arms as well as the shoulders, thus increasing the vigor of the inspiratory movement.

In the use of this machine, the shoulders are alternately elevated and lowered, thus imitating exactly the movements executed in artificial respiration. The action of this apparatus being purely passive, the application may be somewhat extended — five to ten minutes or longer.

*Cannon-ball Massage.*— A cannon-ball (Fig. 20) covered with leather is a valuable mechanical accessory in the application of abdominal massage. The ball is simply rolled upon the abdomen, following the course of the colon from right to left. A ball weighing from four to six pounds is usually employed. I have found the cannon-ball very useful when employed in connection with other measures of treatment. It has an advantage in that it may be employed by the patient himself. It should be used for fifteen minutes morning and evening. In the morning it may be employed just before rising, or half an hour after breakfast.

*The Shot-Bag.*— This is simply a bag containing a quantity of fine shot. The weight should be three or four pounds. It is used in a manner similar to the cannon-ball, being slowly rolled along the colon from right to left. In the writer's experience the shot-bag is less convenient for use in most cases than the cannon-ball. It is, however, better suited to cases in which there is a considerable degree of abdominal tenderness.

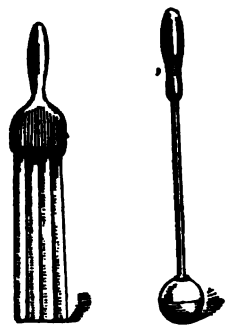
*The Weighted Compress.*— A quilted compress (Fig. 21) containing several pounds of fine shot, large enough to cover the anterior portion of the abdomen with the patient lying down, has been recommended and successfully used as an aid in inducing intestinal activity. The weighted compress acts simply by increasing the intra-abdominal tension, thus compelling the patient to breathe with greater vigor, and thereby administering to himself a sort of automatic massage to the abdominal contents, through the descent of the diaphragm, and the compression of the organs between the diaphragm and the weighted abdominal wall. The cannon-ball may sometimes be advantageously employed in connection with the weighted compress.

The chief advantage of the cannon-ball, shot-bag, and weighted compress, is that they may be used by the patient himself, without the assistance of the masseur. In the majority of chronic cases requiring abdominal massage, they are not, however, sufficient in themselves to accomplish the results desired, but may be useful adjuvants.

*Muscle Beaters.*— Some twelve or fourteen years ago, Klemm, a German empiric, introduced his so-called "muscle beater," consisting of elastic rubber tubes attached to a handle, which were used as a sort of cat-o'-nine-tails in whipping and flagellating various parts of the body.

The muscle beater may be most advantageously employed upon thick and fleshy masses, and upon those portions of the body which are but slightly sensitive, as the back. The mode of application by a masseur is shown in Fig. 22. When the muscle beater is used by the patient in self-treatment, but one beater is ordinarily employed.

Various forms of muscle beaters have been devised. A form which I have found more convenient than that invented by Klemm (A) consists of one or more rubber balls attached to a flexible rattan or whalebone handle (B). One, two, or more balls may be employed, and of any size desired. The last-described form is an American invention.



A. Klemm's Muscle Beater. B. Ball Muscle Beater.

*Electric Massage.*—Various appliances ances have been proposed for administering massage by means of a specially constructed electrode, thus applying massage and electricity at the same time. A much better mode is the application of electricity through the hand, by connecting the patient with one pole, while the masseur connects himself with the other pole by grasping the electrode with his other hand or fastening it about his arm. The application of electricity through the hand is often useful, and sometimes even necessary; but I have never been able to see any special advantage in the simultaneous application of massage and elec-

FIG. 17. REVOLVING SEAT.

FIG. 18. TILTING SEAT.

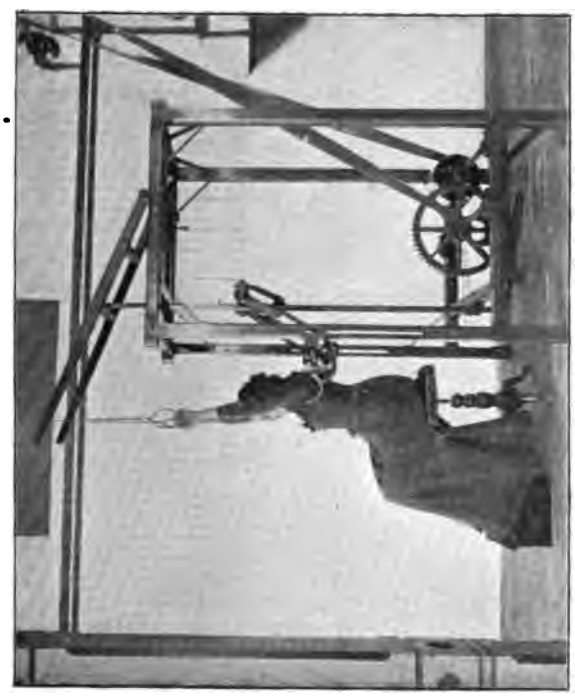


FIG. 19. APPARATUS FOR ARTIFICIAL RESPIRATION.

FIG. 20. CANNON-BALL MASSAGE.

FIG. 21. WEIGHTED COMPRESS.

FIG. 22. MUSCLE HEATING.

FIG. 23. MECHANICAL SWEDISH MOVEMENT DEPARTMENT OF THE BATTLE CREEK SANITARIUM.

tricity otherwise than in the employment of the electrical current by the hand, either held upon a fixed point, as in passive touch, or with gentle stroking.

## REPORT OF CASES ILLUSTRATING THE SUCCESSFUL TREATMENT OF SOME SEVERE FORMS OF NERVOUS DISEASE.

BY W. H. RILEY, M. D.,
Sanitarium, Battle Creek, Mich.

(Concluded.)

### CASE XI.

*Diagnosis.*— Paraplegia, and convulsive tic on the right side of the face.

*History.*— The patient is a man sixty-two years old, of good habits, and has always lived an active life. He thinks he has been suffering from nervous exhaustion for a number of years. For the past four or five months, he has had weakness in his legs, and at present has considerable difficulty in walking, being obliged to use a cane. He has had malarial fever at different times in the past. The muscles of the legs are in a somewhat spastic condition, although this difficulty is not very great; the tendon reflexes are increased in both legs; there is some paresthesia in the lower limbs, but no loss of sensation; his speech is thick and heavy, and resembles that of a person suffering with bulbar paralysis; he also has well-marked convulsive tic on the right side of the face. This has affected him for a number of years, and is very troublesome. The muscles on the right side of the face are almost constantly in a state of clonic contraction. These muscular spasms in the face are increased when he eats or talks, or when the nerve is irritated by a draft or from any other cause. The patient's appetite is fair, though his digestion is somewhat disturbed; his bowels are regular; he has some palpitation of the heart, is very nervous and emotional, weeps on the slightest provocation, and is very despondent. The heart is somewhat weak.

*Treatment.*— The patient was placed under treatment as follows: Fomentations to the face for one-half hour, followed by a cool shower bath with friction daily; a hot blanket pack to the legs for one-half hour, followed by a cool shower and general massage every other day; a tonic salt-glow bath twice a week, with a full electric bath once a week; the galvanic current applied to the spine and legs three times a week. Besides these measures, mechanical Swedish movements and a graduated course of exercise entered into the daily program of the patient. Under this treatment he made very rapid improvement. In six weeks' time he was very much stronger, and was able to walk long distances without a cane; the extreme mental depression and nervous irritability with which he was suffering when he began treatment were entirely relieved; the spasms on the right side of the face, while not entirely cured, were greatly relieved. A comparison of the strength of the muscles of the lower limbs at the time of beginning treatment with that at the time of leaving it off showed a large gain in muscular strength in the affected muscles. The improvement in this case was certainly very satisfactory. The patient being a man sixty-two years of age, and with all the symptoms of an organic lesion of the spinal cord, together with the other troubles referred to, made his case rather a difficult one to manage, and it was hardly expected by his physician at the beginning of treatment that his improvement would be so great as it really was; but by persistent use of the remedies herein indicated, the results were most satisfactory to both patient and physician.

### CASE XII.

*Diagnosis.*— Sciatica in the left leg.

*History.*— The patient is a man thirty-eight years old, a farmer by occupation. He gives no history of any hereditary trouble. His father died of bronchitis. The patient has enjoyed good health until a little over a year ago, when he took cold while working out of doors, which he thinks is the cause of a troublesome pain in the back part of the left hip and thigh, and extending down the leg. This pain has continued with him more or less ever since, and has given him a good deal of annoyance. He describes it as a dull, aching pain, with a sensation of numbness along the back part of the limb. These symptoms are usually worst at night. The muscles of the left leg are soft, flabby, and weak. There is no great loss of sensation in the limb. The patient

suffers some from indigestion, his bowels are constipated; and he has some pain in the back of the neck.

*Treatment.*— The patient was put to bed, with all exercise prohibited, and placed under treatment consisting of applications of heat along the course of the left sciatic nerve for one hour twice a day. This was followed by a cool spray at a temperature of 70° F. for one minute, and this in turn followed by a brisk rub. In addition to this, the galvanic current was applied along the course of the sciatic nerve in the manner which has been described before; that is, the negative pole was applied to some indifferent point of the body, while the positive pole was applied over the seat of pain. This treatment was given daily, a current of twenty milliamperes being used, and the application lasting each time from fifteen to twenty minutes. Besides the treatment which was directed to the sciatic nerve, he received other treatment to improve his general health and digestion, which consisted of a carefully regulated diet and the use of massage over the whole body, and the application of the faradic current. Salt baths were also given twice a week. The patient remained under treatment one month, at the end of which time he was practically relieved of his distressing troubles.

### Case XIII.

*Diagnosis.*— Nerve exhaustion and emaciation following an attack of malarial fever.

*History.*— The patient is a young man twenty-six years old, who has usually enjoyed good health. A short time ago he had an attack of fever lasting about two weeks, with temperature varying from 101° to 103° F. The character of the fever is not positively known, as the patient was not under the writer's care at that time. The fever left the patient in a weak, emaciated condition, with well-marked paresthesia in his feet, legs, hands, and arms. This feeling of numbness is very disagreeable and distressing, and has caused the patient a great deal of anxiety; he has come to the institution to find its cause, and to be relieved of it if possible.

The physical examination shows that the muscular strength of the patient is very much below the normal, but there is no true motor paralysis. Numbness in the feet and hands is a very prominent symptom, but there is no loss of sensation. The reflexes, both deep and superficial, are present, and are apparently normal.

*Treatment.*— The patient was put under treatment consisting of the use of hydrotherapy, massage, and electricity. To relieve the distressing symptoms of numbness in the extremities, alternate applications of the hot and cold spray to the limbs were used. After treatment the limbs were thoroughly dried and briskly rubbed. Besides this, the patient received general treatment to improve his digestion and general health. He began to gain almost from the first; his appetite improved, he increased in weight, and the disagreeable sensations and numbness in the extremities soon disappeared. He remained under treatment three weeks, at the end of which time he was entirely relieved of his trouble, and had gained much in strength.

### Case XIV.

*Diagnosis.*— Paraplegia.

*History.*— The patient is a young man twenty-nine years old. He had spinal disease when young, which prevented his walking until he was six years old. The present trouble began about three months ago, when he had an attack of vomiting, attended with pain in the left side. His physician gave him a hypodermic injection of morphine. This was followed by delirium and insanity, which lasted about fourteen days. At the end of this time he noticed that his legs were weak, and he had trouble in walking. He had some pain in the legs above the knees. These symptoms have been gradually increasing from the first. At present he can walk only a few steps, and that by the use of a cane, and tires very easily. He has numbness in the feet, and a sensation as of pins and needles sticking in his feet when standing. He has difficulty in emptying the bladder, and a burning sensation in the region of the bladder when passing urine. There is some anesthesia in the legs below the knees; his heart is very weak. He has been in the habit of smoking excessively, which is probably the cause of the weakness of his heart. His appetite is fairly good, but his digestion is poor, and his bowels are constipated.

*Treatment.*— He was placed under treatment consisting of a hot blanket

pack to the legs followed by a cool spray at a temperature of 70° F. for one minute, followed by a brisk rub every day. Besides these, massage treatment was administered three times a week; and the general application of the faradic current twice a week, with a full electric bath followed by a salt bath once a week. The use of the mechanical Swedish movements and a carefully graduated course of exercise entered into his daily program. The patient made very rapid improvement from the first. In two weeks' time he was able to walk quite well a short distance without a cane. At the end of about five weeks, he left off treatment and went home, being entirely relieved of the paralysis in his legs. He had gained several pounds in flesh during his treatment. His improvement was certainly all that could be desired, and the patient was delighted with the results obtained by treatment.

CASE XV.

*Diagnosis.*— Neuritis of the right seventh cranial nerve, producing complete paralysis of the muscles of expression on the right side of the face.

*History.*— The patient is a young man, a student, twenty-one years old, who is strong and well-built, and has the appearance of being robust. He says he has nearly always enjoyed the best of health. His present trouble began a few weeks ago, when he noticed slight pain and numbness in the right side of the face, which lasted a few days. This was followed in two or three days by paralysis of the same side of the face. In about eighteen hours from the first symptoms of weakness in these muscles of the face the paralysis was complete, and involved all the muscles supplied by the right seventh cranial nerve. He came to the Sanitarium to be treated for this trouble.

The examination shows that the paralysis of the affected muscles is complete. The eye remains open, and cannot be closed by any effort of the will. Food collects between the right cheek and the teeth, which gives him considerable difficulty in eating. The right side of the face is relaxed, and the mouth is drawn slightly to the left by the action of the unopposed muscles. The facial wrinkles are obliterated on the paralyzed side, thus removing all expression from that side of the face.

The seventh nerve was carefully tested by the galvanic and faradic currents, and the irritability of the nerve at this time was increased. By the way, this latter is a condition which is usually overlooked in descriptions of this disease. I have had an opportunity of examining quite a number of cases of patients suffering in this way, and have found that in the very early stages of the disease the irritability of the nerve is increased by both the galvanic and the faradic currents. Later in the disease, of course, the irritability of a nerve becomes less to both the galvanic and the faradic currents, while the irritability of the muscles increases to the galvanic current, presenting the so-called reaction of degeneration of the nerve.

*Treatment.* — The patient was treated by applications of heat to the face for one hour twice a day, together with tonic treatment consisting of general applications of the faradic current, electric baths, salt glows, tonic baths followed by a cool spray bath daily at a temperature of 75° F. for one minute, and a spray bath followed by a brisk rub. After the irritability of the nerve had subsided, the galvanic current was applied to the face daily, an uninterrupted current being used, and the positive pole applied over the face. The patient continued this treatment for two months, at the end of which time he was completely cured of the paralysis of the muscles of the face, being able to pucker his face as in whistling, and to close his eye, and having complete control of all the muscles which had been paralyzed.

CASE XVI.

*Diagnosis.*— Neurasthenia with insomnia.

*History.*— The patient is thirty-eight years old, a merchant. He has usually enjoyed good health. Some years ago he was troubled considerably with indigestion and headache. Previous to twelve years ago his occupation was that of night operator in a telegraph office, and he thinks that this had much to do with his insomnia. He has not slept well for twelve or thirteen years. He has a feeling of exhaustion, tires easily when doing physical or mental work, is depressed mentally, usually wakes in the latter part of the night and has difficulty in getting to sleep again. He has some indigestion, the tongue is coated with a yellowish white coat, the bowels are con-

stipated, and he has hemorrhoids. He has a pressure downward in the top of his head, slight frontal headache, and feels under a nervous tension nearly all the time.

*Treatment.*— The patient was put under treatment consisting of alternate applications of heat and cold to the spine, and the cold spray followed by massage three times a week. This treatment was given in the morning. On alternate days a faradic current was applied to the body. In the evening the patient was given a warm electric bath, with a cool compress to the head, and retired immediately after his bath. His diet was regulated, and his digestive troubles corrected by proper treatment. He began to improve after being under treatment about two weeks, and continued to do so. At the end of five or six weeks he felt well enough to dispense with his treatment, and went home well satisfied with the results of his stay.

CASE XVII.

*Diagnosis.*— Insomnia.

*History.*— The patient is a young man twenty-four years old. He has usually enjoyed good health, with the exception of the diseases common to childhood, from which he recovered without any bad results. Since the age of eighteen years he has led a life of dissipation, but says that he left it off about six months previous to his application for admission to the Sanitarium for treatment. Recently he has been very nervous, restless, and despondent. He has difficulty in getting to sleep, is easily aroused, and does not sleep enough to become rested, so that he wakes in the morning feeling more depressed than when he retired. His symptoms are usually more prominent in the early part of the day. He has a tired feeling in the small of the back and a confused feeling in the front of the head, which as a rule is increased by reading or doing mental work; his memory is very poor; his reflexes, both deep and superficial, are rather lively, but not sufficiently so to indicate any organic disease; the sensations are normal; his appetite is poor, his digestion much disturbed, and his bowels constipated; he also has hemorrhoids. All these symptoms are undoubtedly the result of his dissipation.

*Treatment.* — He was placed under treatment as follows: Warm sitz bath, at a temperature of 105° F. for ten minutes, followed by a temperature of 100° F. for five minutes; cold compress to the head; light massage every evening before retiring; the alternate application of heat and cold to the spine, followed by a cool spray early in the morning daily. The diet was carefully regulated, and the patient put on a graduated course of exercise. He began to improve almost from the very first, and within a few days was able to sleep well without the aid of drugs, which he had not been able to do for some time; his appetite and digestion began to improve, and at the end of three weeks he had gained eight pounds in flesh. He remained a few weeks longer, at the end of which time he felt better than he had for years previously, and left the institution well satisfied with his improvement, although it was thought that he ought to remain longer, in order to become fully established in health, and to prevent his going back to his bad habits.

CASE XVIII.

*Diagnosis.*— Right hemiplegia, involving arm and leg.

*History.*— The patient is a man thirty-five years old. He has usually enjoyed good health up to about four years ago, at which time he had a stroke of apoplexy, which developed suddenly. It was attended with unconsciousness, and followed by complete hemiplegia of the right side, involving face, arm, and leg. At the beginning of the paralysis of the right side of the body, he had aphasia and also diplopia. The aphasia was quite complete at first, but this improved, and at the time of my examination he was able to converse very well, except that he would misplace his words, calling objects by the wrong names,—in other words, he was suffering from paraphasia. The diplopia lasted only about four months. At the beginning of his attack he was confined to the bed about three months. At the end of this time he began to walk, and has continued to improve some since. At present he walks with a cane, but scrapes the floor with his toes when walking, goes about with his arm flexed at the elbow joint and the hand flexed at the wrist, and the fingers closed within the palm of the hand. The knee-jerk is increased in both limbs, but more in the right. The skin reflexes are also increased, and there is ankle

clonus in the right leg. The elbow-jerk of the right arm is also very much increased, and contraction of all the muscles of the arm can be very readily developed by a light tap on the muscles. The muscles of the right arm and leg are in a spastic condition. The patient's appetite is poor, his tongue is some coated, and he has some indigestion; his heart is also weak.

*Treatment.*— He was put under the following treatment: A hot blanket pack applied to the body with a cold compress about the head, followed by a cool spray and massage, was given two or three times a week. The object of the hot blanket pack and massage was to relax the spastic condition of the muscles, and to improve the circulation in the paralyzed parts. In addition to this, the faradic current was applied to the paralyzed muscles every day, care being taken to apply the current to those muscles which needed strengthening in order to overcome the spastic condition of the opposing muscles.

In addition to this, the patient's diet was carefully regulated, and the bowels kept open by diet and treatment. Various manual and mechanical Swedish movements and a carefully graduated course of exercises were also made use of after careful testing of the paralyzed muscles. He was also given free doses of potassium iodide three times a day, in the hope that it might be of some service in producing absorption of the spastic exudate.

During the earlier part of his treatment the patient seemed quite despondent and confused mentally, and was unable to express himself very well; but these symptoms gradually disappeared, and at the end of four months he went away very much improved in every respect. His digestion was very much better, and he had gained much in strength, which, considering the fact that his case was one of several years' standing, and his symptoms all pointed to organic changes in the brain, affecting the upper segment of the motor path, was certainly very satisfactory.

### Case XIX.

*Diagnosis.*— Morphine habit.

*History.*— The patient is forty-four years old, a lawyer. One uncle and one aunt have died of consumption. He has had most of the diseases common to childhood. Following scarlet fever in childhood, he had some dropsical trouble, and was injured when quite young by a log rolling upon him. He also had smallpox at the age of eighteen. He came to the Sanitarium especially to get rid of the morphine habit. He began to use the drug about six months ago, for the purpose of stimulating himself when depressed from work or other causes. He has also been in the habit of using alcoholic liquors for some time past, and smokes and chews tobacco incessantly. At the present time he uses twenty-five grains of morphine daily, taking it in divided doses, three times per day. He is extremely nervous and irritable, and has sensations of heat about the body and numbness in the hands and feet at times. His appetite is very changeable, tongue is some coated, digestion disturbed, and there is gas on the stomach and acidity at times; the bowels are obstinately constipated; the heart's action is weak; the extremities are cold, and the palms of his hands and the soles of his feet clammy; he has an uneasy, disagreeable feeling about the heart; his voice is husky; he is very nervous, but sleeps well; he has a feeling of soreness all over his body whenever the morphine is reduced, as well as extreme mental depression and pains in different parts of the body. The knee-jerk is present in both limbs; the skin reflexes are present and normal; sensations are also normal.

*Treatment.* — The patient's treatment was as follows: He was put under the care of a competent nurse, and the morphine taken away gradually. He was given an application of heat and cold alternately to the spine for fifteen minutes, followed by a rubbing with fine salt, as a tonic, and this by a cool spray. This treatment was given every forenoon. In the afternoon he was given a warm electric bath, followed by massage. The distressing pains caused by the removal of the morphine were readily relieved by the galvanic current. Besides this the patient's program was so arranged as to keep him occupied, and thus divert his mind from his feelings. The purpose of the treatment was to relieve the depressing symptoms caused by the removal of the morphine, and to tone up the nervous system and give the patient sufficient resistance to prevent the liability of his return to the use of the drug.

The patient began to improve almost from the first. The morphine was quite rapidly reduced, and by the end of two weeks was entirely withdrawn. During the first month of treatment he suffered considerable pain in the region of the right kidney, which upon careful physical examination was found to be enlarged. This kidney was removed by an operation, and was found to be badly diseased. The patient improved rapidly after the operation, and after four months' treatment he was entirely cured of his trouble. He had gained several pounds in weight, and went home enjoying the best of health.

CASE XX.

*Diagnosis.*— Neurasthenia.

*History.*— The patient is a man fifty-six years old. His father died of some pulmonary trouble at the age of fifty-two years. His present difficulty began about two years ago, with what he thinks was inflammation of the stomach. At present he suffers from indigestion; has a foul tongue, and a sensation of weight in his stomach after meals; bowels are constipated, and he is troubled with hemorrhoids. He has a feeling of weakness, which is usually increased by slight exercise. He complains of a pressure on the top of his head; has a dull, aching pain in the back of his head; is very despondent, and worries a great deal about business. His muscular strength is much below the normal, the muscles being soft and flabby. Deep and superficial reflexes are present and normal.

*Treatment.*— The patient was placed under treatment consisting of the cool shower bath at 70° F. for one minute, followed by a brisk rub. This was given in the early part of the day. Later in the day he had another treatment, either massage or an application of the faradic current, the current being applied over the body generally. The use of the mechanical Swedish movements and a graduated course of exercise entered into his daily program. After remaining under this treatment for about two months, he was entirely relieved of all his distressing symptoms, had gained several pounds in weight, and his physical strength was very much increased.

CASE XXI.

*Diagnosis.*— Multiple neuritis following diphtheria.

*History.*— The patient is a young man about seventeen years of age, a student. About two months ago he had a sore throat, which his physician thought was tonsillitis; this lasted about five weeks. Some four weeks after the beginning of the soreness in the throat, he began to have numbness in his hands and feet. This increased in severity until he came under my care, which was about two months from the first of the trouble with his throat. At the time of my examination, numbness was well marked in the arms, hands, feet, and legs below the knees, and there was considerable loss of sensation in these parts. Two or three weeks before he came under my care, he began to notice that he was losing muscular power, and this condition had gradually increased up to the time of the examination, when he could walk but a very short distance, and that only with the help of a cane. There is considerable weakness in the upper extremities; the grip of the hand is much below normal. There is inco-ordination in his movements, and he staggers about as he walks; this is greatly increased when the guidance of vision is withdrawn by closing the eyes, so that he cannot walk at all with his eyes shut.

Physical examination shows considerable loss of sensation in the lower extremities below the knees, also in the hands. The knee-jerk is absent in both limbs; skin reflexes, plantar, cremasteric, and abdominal, are absent.

*Treatment.*— The patient was placed on treatment consisting of a hot blanket pack to the legs followed by cool spray to legs at 75° F. for one minute, the patient being carefully dried and briskly rubbed after the cool spray bath. He also received massage treatment on alternate days, and a general application of the faradic current over the body three times a week. In addition to this, the galvanic current was applied to the legs and spine daily, the positive pole being used over the seat of pain and anesthesia. As the patient became better, he was placed on a graduated course of exercise. He continued under treatment for about seven weeks, at the end of which time he was able to walk as well as he ever did. The sensation in his limbs had nearly or entirely returned, and there was but a slight numbness in his hands and feet. His recovery was practically complete.

### Case XXII.

*Diagnosis.*— Gastric neurasthenia.

*History.*— The patient is a young man twenty-five years old, a student. His father died of lung trouble; he has two or three aunts who have sick-headache and other neuroses, and are of a nervous temperament. The patient himself has had pleuropneumonia, but recovered from this without leaving any apparent bad results. He is of a nervous temperament, and has never been rugged; has been a student in school for the past nine years. He had la grippe twice previous to 1894, which left him in a weak and nervous condition, and he has been an invalid ever since. In the summer of 1894 he was overheated; this prostrated him, and he thinks has much to do with his present condition. He has attempted to continue his professional studies at different times during the past four years, but has always been obliged to give up on account of his health. He has been troubled a great deal with insomnia for the past year or two; has a constant feeling of weakness and exhaustion.

His condition at the time of my examination was as follows: Appetite poor; gas in stomach; acidity of the stomach; a disagreeable sensation in the region of the stomach when empty; tongue coated, white, soft, and flabby; gas in bowels, and constipation; also pain in the region of the liver; circulation poor; action of the heart weak; and extremities cold. There is soreness of the muscles, dull aching pain in the back of the head, with pressure downward on the top of the head; also frontal headache, which is increased by exercise. The headache, however, is not severe in character. He is extremely despondent, and is in a depressed mental condition nearly all the time; is apprehensive of some apparent danger, and has thought that he would lose his mind; has emissions occasionally; eyelids quiver when closed; has considerable inco-ordination when eyelids are closed. His heart is weak; pulse, 80 per minute. Knee-jerk is exaggerated. The skin reflexes are present, and apparently normal; stomach is prolapsed to about the level of the umbilicus; there is some soreness in the lumbar region.

*Treatment.*— He was placed on treatment as follows: After an analysis of the stomach fluid obtained from a test breakfast, and the careful regulation of his diet, his muscular strength was tested by the mercurial dynamometer. By the use of hydropathy, massage, faradic and galvanic electricity, mechanical and Swedish movements, correcting all his bad habits, plenty of rest, and a moderate amount of exercise, he made rapid improvement. He remained under treatment one month, during which time he gained twelve pounds in flesh, became much stronger physically, and the mental depression nearly disappeared. He could sleep well, bowels were regular; in fact nearly all the disagreeable symptoms which had troubled him so long were nearly if not entirely gone. The improvement in his case was certainly very satisfactory, when it is remembered that he had been an invalid for the previous four or five years, having been unable to do any work, either physical or mental, and that he had tried every kind of medication.

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**Thyroid Extract in Goiter.**— Numerous cases are reported in which the continued use of thyroid extract for some time has resulted in a great reduction in the size of large goiters, as well as in the cure of exophthalmic goiters. Bourneville recently reports three cases of myxedema with idiocy, in which great improvement was secured by the use of the thyroid of a sheep, taken by the mouth.

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**Leucocytes in Tubercular Processes.**— Stein and Ebmann, as the result of careful studies of the blood in cases of tuberculosis, conclude that the following clinical inferences may be drawn: —

1. Increase of the number of leucocytes in cases in which no suppuration or exudative process exists, is evidence of the beginning of destructive action.
2. A sudden increase indicates a beginning and a distinctive process.
3. A normal number of leucocytes excludes cavity or destructive process.

The observers found that the increase of leucocytes after hemorrhage in tuberculosis is no greater than after hemorrhage from other causes, leucocytes being found normally (1) in the beginning of phthisis; (2) in advanced cases of tuberculosis, limited to apices, or without cavities; and (3) in cases of chronic infiltrating tuberculosis with little or no destruction.

# TRANSLATIONS AND ABSTRACTS

[THE articles in this department are prepared expressly for this journal.]

## THE ROLE OF FEVER IN THE MODIFICATION OF DISEASE.

[FROM an address by H. A. Hare, M. D., professor of therapeutics in the Jefferson Medical College of Philadelphia, we extract the following important ideas concerning the rôle played by fever in disease.—ED.]

As long ago as the time of Hippocrates, he expressed the belief that fever was a protective process. Many others, more or less remote from our times, have endorsed his views, so that we find the professional mind first regarding the fever as salutary, then as an annoying symptom, then as a symptom to be regretted, and, very recently, as a symptom to be controlled as a crying evil.

Notwithstanding the fact that the usefulness of fever has been recognized in the past, it is my intention to bring forward additional evidence in support of this view, and against the idea that fever is harmful; or in other words, to show, by the introduction of the newer evidence produced in recent years by bacteriological and other research, that fever is not an unmitigated evil, and that when we reduce fever by the use of drugs, we deprive the body of a therapeutic measure devised by nature for the protection of the individual. It is but a few months since most of us were reducing all fever by the use of antipyretic drugs.

There is an immense amount of evidence to show that fever is harmful, if the temperature really becomes very high (108° or 110° F.); but there is almost no evidence that it is harmful below this point, it having been proved that much, if not all, the morbid changes in structure thought to be due to the fever are really produced by germs or their toxins, even if no rise of temperature has occurred.

Experiments by Welch and Naunyn have shown that animals can bear very high artificially induced temperatures, provided no infectious processes be present to weaken the organism.

Is fever protective against infection? This belief seems to be sanctioned by the following facts: —

First, fever is a condition developing in all healthy animals as soon as they undertake to resist infection; nature would hardly devise a plan for vital resistance handicapped by such an important phenomenon, if it were useless in itself.

Second, animals which have received sufficiently large doses of germs to cause death, often develop very little fever, or in other words, are so overwhelmed that the body cannot develop resisting measures.

Third, animals receiving smaller doses speedily develop fever and recover; but if the same dose be given, and fever prevented by artificial means, they die as promptly as if large doses were used.

Loewy and Richter, after producing fever by puncture of the corpus striatum, found that infection by the Klebs-Loeffler bacillus, the pneumococcus, the coccus of erysipelas, and the micro-organism of chicken-cholera, failed to cause death as soon as usual, even though a hundred times the ordinary fatal dose was injected; and when three times the fatal dose of pneumococci was injected, the animals with the highest temperature survived.

Wagner found that when chickens were infected with anthrax bacilli, their temperature rose several degrees, and remained there for several days. At the end of that time, no bacilli could be found in their tissues.

If the chickens were kept cool artificially, they promptly died. Similar results ensued when the temperature was reduced by antipyrin, five out of six of the infected chickens dying.

Pasteur also records the fact that chickens infected by anthrax survive, but if cooled they promptly succumb. Rorighi found that guinea-pigs and pigeons, when cooled, resisted infection badly, whereas if the fever persisted, they often recovered.

The dominant tendency of all lethal poisons is to cause a fall of bodily temperature, and the effort of nature is to combat this by an increase of heat-production.

It is important to notice that the immunizing power of the antitoxins is much greater when they are subjected to a temperature higher than that of the body, before being injected. Thus, if heated to 106° F. before injection, the development of immunity is much more rapid than

when cooler injections are made. Further, if previously heated antitoxin is introduced into the circulation, the systemic reaction is far less than when the toxin is not heated. The Klemperers think that the object of this high fever following immunizing injections is to produce similar effects to those obtained by heating the toxin before injection. Thus fever in some way aids the body in acquiring immunity by the formation of antitoxin. The functional activity of all the organs is increased by the rise of temperature, and thus the various methods adopted by nature for the protection of the body against infection are stimulated to the uttermost.

Many years ago it was the effort of physicians to reduce fevers by diaphoresis and diuresis, and they often succeeded in aborting febrile movement by measures too often to-day considered useless. The trouble, if preventable, was set aside; and if not, its true course and the object of its existence were not masked by powerful drugs. Unfortunately for the profession, it was discovered that digitalis sometimes reduced fever. Quinine soon took a valued place as an antipyretic. Something stronger was required, and the nearness of the period of ridiculous fear of exposure to cold in fevers excluded cold applications from the therapy of such cases. Salicylic acid was therefore introduced, and from this it was but a step to the common antipyretics of to-day.

There is, however, abundant evidence to prove that the older methods of reducing fever by the production of sweating and increased glandular secretion had a far more rational basis than has the employment of antipyretic drugs; further, that antipyretic drugs in reducing fever decrease the vital resistance of the patient, and that the use of the cold bath or cold sponging as employed to-day does good, not so much by the reduction of temperature, as by increasing glandular and other vital activities.

I believe that antipyretic drugs should very rarely be used for the purpose of reducing fever, for they depress the nervous centers governing heat-production, and increase the work of the emunctories, already loaded down by the poison brought to them for elimination. They arrest, too, the development of leucocytosis, and thereby remove one of the means of destroying the germs of disease. The studies of Jaeubowitsch, Müller, and others prove that antipyrin decreases the elimination of urea, and also the urinary flow, thus lessening excretion of effete matter. This drug also interferes with the poison-destroying function of the liver, by congesting it, as pointed out by Baruch; and Porter asserts that these antipyretics in the presence of fever may cause granular and fatty degeneration in the kidney and liver. Clinically the mortality of infectious diseases has been higher under this method of treatment than when antipyretic drugs were unknown. The death-rate from typhoid fever, for example, is twenty-five per cent., while in cases treated by the cold bath, it is from one to five per cent., as a rule.

The natural thought is that if antipyrexia is harmful when obtained by drugs, it is also harmful when obtained by cold baths, but clinical results prove the contrary. I have long felt that the cold bath did more than to abstract heat, and I venture to advance the idea that it also permits the tissues to destroy the poison of the disease by oxidation or allied processes. By the use of antipyretic drugs we decrease the production of heat, and thereby inhibit oxidation processes, whereby the body destroys the infecting poison, if left to the guidance of nature. On the other hand, by the use of the cold bath we actually increase the temperature of the internal organs, as shown by Liebermeister, who found that the internal temperature of the body was raised by the use of cold, and the greater the cold, the greater the rise. Thus the cold bath really increases the destruction of toxin. It abstracts heat only, and when properly employed, actually increases bodily metabolism, or tissue interchange. Liebermeister, Röhrig, and Zuntz have also shown that the use of cold applied externally increases oxidation in the body, so that a larger amount of oxygen is taken up, and more $CO_2$ is eliminated. The experiments of Thermes prove that cold bathing increases the number of blood corpuscles and the amount of their hemoglobin.

The cold bath also stimulates glandular activity and leucocytosis, improves the tone of the nervous system and of the circulation, increases vital activity everywhere; and it also increases the urinary flow and the quantity of solids in the

urine. The cold bath, therefore, has a physiological action far more important than the withdrawal of heat; it really puts the system in the best condition to resist disease.

My views may therefore be summed up as follows:—

1. Moderate fever has been proved to be in itself harmless. Hyperpyrexia is of itself harmless.

2. Moderate fever has a useful function to perform in the body in the presence of an infection.

3. Cold baths do good, not by the mere abstraction of heat alone, but by increasing metabolism and the rapidity of all vital processes.

4. The use of antipyretic drugs is contraindicated in all infectious diseases.

## A VEGETARIAN DIET AND MUSCULAR WORK.

DR. HAIG gives a contribution to the physiology of fatigue which is interesting when taken in connection with his well-known views as to the agency of uric acid in producing many distressing symptoms. He observes that when the blood contains much uric acid, the excretion of urea is diminished, and maintains that this is due to the fact that when the blood contains much uric acid, the capillary circulation is so interfered with that metabolism in the tissues does not take place with normal activity, nor are waste products removed with due rapidity. The effect of exercise is, then, to increase the formation of urea; and if there is a free circulation through the tissues, this urea will pass almost at once into the urine, to be excreted. There will thus be comparatively little fatigue, and greater and longer continuance of exertion will be possible; but if there is a quantity of uric acid in the body or the food, so that the rise in the blood's alkalinity, which the exercise and perspiration produce, can dissolve a large amount and bring it into circulation, then circulation through the tissues will be interfered with, urea will not be removed, and great fatigue will result, so that continued exertion may be impossible. The greater tendency to fatigue in hot weather is accounted for by the fact that perspiration induces increased alkalinity of blood, and so, other things being equal, the blood will sooner become charged with uric acid in hot weather than in cold.

The corollary of all this would seem to be that a vegetable diet ought to be the best on which to do muscular work, and this Dr. Haig maintains to be the case, especially for prolonged exertion, and he cites a long-distance walking competition in which the winners out of a large number of competitors were vegetarians. The benefit of training lies in the fact that exercise provides for a free excretion of uric acid every day, so that a man in training will not have so much uric acid in his body available for solution as one on the same diet, who is confined to sedentary work.

**Nature's Method of Vaginal Antisepsis.**—William T. Lusk, M. D., LL. D., of New York, expresses himself as strongly opposed to the vaginal douche, before and after parturition. While the vaginal canal abounds in micro-organisms, he considers that they only intensify the acid reaction of the vaginal secretions, and render the latter especially unfavorable to the multiplication of the streptococcus, which is the germ that produces puerperal septicemia. The normal vaginal secretions furnish a soil hostile to all forms of cell growth. The cervical canal of the pregnant woman is protected from the invasion of micro-organisms by a mucous plug, and thus in natural labor the protection of the uterine cavity is complete. The entire parturient act, furthermore, serves to guard the woman against infection. With the rupture of the membranes the downward current is produced by the escape of amniotic fluid. The descent of the child cleanses the vaginal canal, and the associated leucocytosis and increase of vaginal secretion are inimical to the action of the septic germs. Finally the passage of the placenta completes the toilet of the vagina.

The fact that nature provides this excellent means of self-defense clearly shows that the disturbing methods of disinfection employed before and after labor, under the plea of prophylaxis, are not commendable. The antiseptic douche dissolves the mucus, sets free the imprisoned germs, weakens the resistance of tissue, and contributes to the extension of the source of infection.

A careful examination of hospital statistics shows that, with the abolition of the routine practise of douching, the morbidity is diminished, and the mortality statistics are slightly more favorable.

**Alcoholic Diabetes.**— M. Glenard (*Revue de Med.*, February, 1896) has shown in various publications that true diabetes results from the habitual use of alcohol. The facts which he presents indicate that some of the previous views with reference to the relation of the liver to diabetes were erroneous. It has been believed that the liver is normal in true diabetes, and that the affections of the liver cannot, of themselves, give rise to diabetes; but this position must now be abandoned, since cirrhosis, hypertrophy, interstitial hepatitis, fatty degeneration, atrophy, and other morbid conditions of the liver have been noted in diabetes.

**New Method of Staining Nervous Tissue.**— Vastarini-Cresi (*Rif. Med.*, February, 1896) describes a new and effectual method of staining the spinal cord, etc., for microscopic purposes. The entire cerebro-spinal axis, with the meninges, is plunged into about three liters of an aqueous solution of formaldehyde (16 per 1000). The tissue is left in this liquid for two weeks, the meninges being removed on the second or third day. Sections from three to five centimeters thick are then cut and kept in distilled water, or better, in alcohol, at 40° F., for twelve to twenty-four hours, then placed in .75 per cent. solution of Ag $NO_3$ in the dark. The white substance soon becomes stained brown. A prolonged stay in the Ag $NO_3$ does no harm.

The stain may be fixed for an indefinite time if the preparation is left for two or three days in the dark in distilled water, and then in alcohol at 70° F.

Tissue so prepared shows in the clearest manner the relations between the white and the gray substance; for example, in the medulla one could distinctly see with the naked eye the respiratory fasciculus of Krause. The advantages claimed by the author for this method are its simplicity and rapidity of execution, the constancy of the results, and its great teaching value.

**Variability of Streptococci.** — M. Lemoine has recently published the results of a laborious investigation concerning the variation in the characteristics of the different species of streptococci. The inquiry had special reference to the characteristics shown by potato cultures and cultures in milk. He observes great variability in form. He has found no difference in virulence between short and long streptococci. Gelatin cultures were uniformly the same for all varieties. Liquefaction of gelatin was never observed. Growths upon agar showed the typical transparent colonies of erysipelas. Some differences were shown to be due to difference in origin. Cultures made from erysipelatous plaques gave typical growths immediately; while those of bronchopneumonia, vaccinal ulceration, and furuncle required the second culture for the development of the typical growths, and in some other cases the typical growths appeared only in the third or fourth generation. The erysipelatous type was especially observed in the streptococci of sore throat and of the saliva. The streptococci growing in milk presented four different characters.

The author concluded that of forty-two different specimens of streptococci examined, all probably belonged to a single species, their different characters being doubtless only the result of the extreme variability of the organism.

**The Walscher Position for Labor.** — The universal position of the patient when the forceps are applied, has been upon the back or side, with the thighs flexed upon the abdomen; in this position the symphysis pubis approaches the promontory of the sacrum, and the true conjugate of the pelvic inlet is shortened six or seven millimeters. On the other hand, if the thighs are forcibly extended, with the patient upon her back, and her lower extremities hanging down over the edge of a table or bed, considerable traction is exerted upon the anterior portion of the pelvis; it is forcibly extended, and the conjugata vera is lengthened six or eight millimeters.

The increase in length, therefore, of the antero-posterior diameter of the pelvic inlet in the Walscher position over that in the position universally assumed, is from one to one and one-half centime-

ters. By placing the patient in this position in the first stage of labor, Fehling and others have secured spontaneous birth in cases where forceps or other instrumental means had been necessary in previous labors. It must be borne in mind, however, that the Walscher position is of value only when the head is at the superior strait; after a head has entered the pelvic cavity, the position should be changed, as by the sinking in of the lower end of the sacrum and coccyx the antero-posterior diameter of the pelvic outlet is shortened.— *American Gynecological and Obstetrical Journal.*

**Antipyretic Drugs.**— Dujardin-Beaumetz (M. Bardet, *Bull. Général de Thérapeutique*, 1896, 5e liv.) always declared that the lowering of the temperature by the use of antipyretic drugs, which are toxic in themselves, was obtained to the detriment of the patient. The thermic elevation is the least important of the phenomena observed in cases of fever. The true therapeutic indication is to favor the elimination of toxic material rather than to reduce the fever. Since these toxic materials are only slightly soluble, some change is necessary before they can be eliminated. This can be accomplished by oxidation, which burns up toxic products, and changes them into soluble, harmless substances. Antipyretic drugs delay oxidation, and therefore interfere with nature's method of defense. This reason alone is sufficient to banish them forever from the rational therapeutics of febrile diseases. Cold baths will abstract heat when necessary, and at the same time increase the phenomena of oxidation.

**The Hygienic Importance of Cheerfulness.**— At the recent annual banquet of the French Société de Hygiène (*Am. Pract. and News*), one speaker dwelt upon the absolute necessity of providing amusements for the masses as a hygienic measure. He mentioned an instance in his own experience, of a regiment whose commanding officer allowed the men to sing on the march. Health, spirits, and strength flourished, and the severest exercises seemed but play to the light-hearted men. The officer was changed, and the newcomer stopped the singing, when the men drooped, and the sick-list grew long.

**Massage in Gynecology.** — M. Ponomereff (*Rev. de Ther. Med. Chirurg.*, Feb. 12, 1896) highly recommends massage in various pelvic complaints in women. This procedure is especially valuable for subinvolution of the uterus. It will generally succeed also in chronic metritis, with sclerosis of tissue, accompanied by endometritis and dysmenorrhea.

In cases of displacement of the uterus or ovaries, it acts by imparting fresh energy to the muscles and ligaments. In perimetritis or parametritis, massage aids in the absorption of inflammatory deposits, in liberating adhesions, and in restoring healthy function.

Pregnancy and acute inflammatory or suppurating conditions alone contraindicate pelvic massage. The technique is simple. After lavage of the vagina and rectum, two fingers of the left hand are introduced, while with the lubricated right hand, motion is freely made over the uterus. Such treatment may be applied every second day, its duration not exceeding ten minutes.

**Serumtherapy in Pneumonia and Scarlet Fever.**— De Renzi has, during the last year, treated ten cases of pneumonia with antipneumonic serum. This serum is prepared in a manner similar to that employed with diphtheria antitoxin. A cure resulted in each case. Out of a series of five cases treated without serum, one died. Marmorek claims to have secured excellent results in the treatment of scarlet fever by antistreptococcus serum. The swelling of the glands rapidly subsided, the albumin disappeared from the urine, the delirium disappeared, and the mortality rate was greatly lessened. Five deaths occurred out of ninety-six cases treated by this method,— four from diphtheria, and one from pneumonia.

**Effects of Ether and Chloroform upon the Kidneys.**— Isendrath, in a study of this subject, concludes that while albuminuria when present is increased more by ether than by chloroform, albuminuria develops more often after chloroform than after ether, the after-effects of chloroform upon the kidneys being far more serious than those of ether, the effects of which quickly disappear.

**The Treatment of Pneumonia without Drugs.**— Dr. Elmer Lee, of Chicago, has discarded the use of drugs entirely in the treatment of pneumonia. In their place he has substituted treatment by the use of water in various ways. Recently he has employed a sprinkle bath. A fountain syringe, containing water of a temperature below that of the body, is hung on the wall, and used to sprinkle the patient. These baths are given every three hours throughout the day. At the same time large quantities of water are given by the mouth, and also by irrigation of the large intestine. Pneumonia patients treated by scientific hydriatic measures are convalescent at the end of the first week, and complete recovery in a proportionately shortened time. Dr. Lee considers this method the quickest, surest, and best in pneumonia.

**Therapeutic Uses of Suspension.**— Worotynski (*Deut. Zeit. für Neuen Heilkunde*) concludes as follows respecting the therapeutic value of suspension: —

1. Suspension is worthy of being employed as a therapeutic measure in nervous diseases.

2. It is impossible, as yet, to establish clearly the indications and contraindications of this method of treatment.

3. Suspension gives excellent results in the second stage of tabes, and very good results in neurasthenia and other neuroses as a symptomatic measure which may be recommended in vertebral caries of tubercular origin and in other lesions of rachitis.

4. Suspension exerts a favorable action upon visual disorders in patients suffering from atrophy of the optic nerve.

5. Suspension is not an indifferent means, and must be employed with caution.

**Pregnancy Contraindicated by Absence of One Kidney.**— J. Schramm (*Berlin Klin. Woch.*, February, 1896), from observing a case of pregnancy and childbirth in a woman upon whom the operation of nephrectomy had previously been performed, concludes that the presence of a single kidney must constitute a contraindication to pregnancy, on account of the danger from renal and cardiac complications.

**Shock.**— Dr. Ben Thompson, writing in the *Journal of Medical Sciences*, says: "Do not when called to take care of an injured person, and finding him suffering from profound shock, administer alcohol. The primary effect of alcohol is stimulating, but the secondary effect is depressing, and then we have, in addition to the shock, the nausea and vomiting due to alcohol." Instead of alcohol, Dr. Thompson uses dry heat, and finds that when the shock disappears, the reaction is permanent.

**Treatment of Chronic Hydrarthrosis of the Knee.**— Dr. C. Legarde treats these cases, when they have become chronic, by aspiration, revulsion with the actual cautery, fixation with a gutta-percha splint, and the electrization of the extensor muscles of the thigh. The aspiration is performed by passing the needle into the upper synovial cul-de-sac situated beneath the quadriceps muscle. The puncture is closed by collodion. After the aspiration, the thermal cautery is applied all about the knee, forty or fifty points. The knee is then placed in the splint. Electricity is afterward applied to the extensor muscles to prevent atrophy, the splint being removed during the application, and reapplied after each sitting. At the end of a month the joint will usually be found cured.

**The Roentgen Ray in the Diagnosis of Arterio-Sclerosis.**— G. Hopp-Seyler has recently employed the Roentgen ray as a means of diagnosis in arterio-sclerosis. The method was found to be entirely successful, the arteries in which the calcareous process had begun being clearly outlined in the photograph obtained.

**State of the Cerebral Capillaries in Arterio-Sclerosis.**— Wratch (*La Presse Medicale*, 1896), by careful examination of the brain substance in fifteen cases in which arterio-sclerosis of the large vessels existed, found the capillaries of the brain normal in but a single case. In nearly all the cases there was marked degeneration of the capillary walls, with notable diminution in the caliber of the vessels, some of which were entirely obliterated.

# BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE AND BACTERIOLOGICAL REVIEW, from original sources.]

**Etiology of Pemphigus Neonatorum.**— Recent investigations indicate the probability that pemphigus neonatorum is of bacterial origin. Frantenorth reports (*Medical Age*) that the staphylococcus aureus has been isolated in pure cultures from pemphyoid vesicles found in the neighborhood of the remnant of the umbilical cord, and also from the navel suppuration. It is believed that the micro-organisms are conveyed from the air to the skin through the bathing water, sponges, etc.

A case has been reported recently which seems to indicate that infection may take place through the blood and lymph channels. The mother had all the symptoms of a severe septic infection, but was permitted to nurse her child. After four days the child presented vesicular eruptions varying in size from a pea to a half dollar, first on the face and breast, and then on the entire body. A bacteriological examination showed the presence of staphylococcus pyogenes aureus and a diplococcus. The staphylococcus pyogenes albus was found only in scattered colonies. A like examination of the milk showed the presence of staphylococcus pyogenes aureus. Inoculations made on glycerin-agar with the blood of the child also yielded positive results.

**Bacteria not Necessary to Digestion.**— In 1890, M. Nencki made, in connection with Mme. Ziber and M. Macfayclen, a series of bacteriological examinations of the intestinal contents of a man having an artificial anus. Besides various microbes, the observers found in the small intestine various products resulting from the decomposition of carbohydrates. The reaction of the intestinal contents was found to be acid. In the large intestine there were found products of the decomposition of the albumins. The character of all these products was such as to render them useless to the system, "from which," said M. Nencki, "it is evident that the presence of bacteria in the intestine cannot be considered as useful to the body." This hypothesis was corroborated by a fact observed by M. Yokovski in a patient who had an intestinal fistula in the origin of the ileo-cecal valve. The patient desiring relief from his infirmity, an operation was undertaken, when it was found that the large intestine was completely atrophied, so that it became necessary to abandon the operation. The patient was nevertheless in good health. From this observation it appears that perfect health can be enjoyed without the aid of the microbes which dwell in the large intestine, and which give rise to the putrefaction of albuminoid substances. It being not at all probable that the products of the decomposition of the hydrocarbons can be useful to the body, M. Nencki thought it proper to conclude that Pasteur was in error in supposing that animal life would be impossible without micro-organisms to aid digestion. This view, expressed by M. Nencki six years ago, has been recently confirmed by the observations of Thierfelder and Nuttall, by whose ingenious experimentation it was proved that a guinea-pig born by Cæsarian section under asepsis could be successfully reared without the aid of microbes of any sort whatever.

**Bacteriological Study of Non-diphtheritic Anginas.**— In the bacteriological study of non-diphtheritic anginas (*Annales de l'Institut Pasteur*) Lemoine has employed a special technique. The throat is washed out with sterilized water, dried with sterilized cotton, and cauterized superficially with the tip of a pipette. The products to be cultivated are taken from the center of the tonsils.

Out of one hundred and sixty-eight cases examined by this author, one hundred and twelve were scarlatinas; six, measles; twenty-nine, non-diphtheritic pseudo-membranous anginas; three, mumps; three, chronic amygdalitis; and fourteen, simple anginas, without pseudo-membranes. In all the cases the streptococcus was constantly found, most frequently associated with other microbes when the cultures were made with the products of the surface of the tonsils. In those cases in which the liquid was aspirated from the interior of the tonsils (one hundred and forty-two in number), streptococcus was associated with staphylococcus eleven times, and with bacillus

coli five times. In the cultures from superficial parts (twenty-three cases) the streptococcus was alone twelve times; associated with staphylococcus, six times; with bacillus coli, three times; and with pneumococcus and bacillus coli, twice. He considers that anginas in general are a manifestation of streptococcal diseases.

**Eberth's Bacillus Causes Osteomyelitis Six Years after Typhoid Fever.** — Bruni (*Annales de l'Institut Pasteur*) records a case in which the patient, after passing through an attack of typhoid fever, had periostitis in the lower third of the right tibia. This apparently recovered but some years later the leg became swollen and tender, and the skin over it inflamed. Six years after the attack of typhoid fever, the tibia was trephined, and an abscess opened. Bacteriological examination of the pus revealed the presence of Eberth's bacillus typhosus. Elsner's differential tests by cultivations in various media were employed; and an adaptation of Pfeiffer's phenomenon,— injecting the micro-organism with antityphoid serum into the peritoneal cavity of an animal,— also showed the micro-organism to be Eberth's bacillus. Experimentally the microbe was found not to possess a high degree of virulence, which is quite conformable with the fact that it had remained latent in the left tibia for a period of six years, and had given rise to an apyrexial chronic osteomyelitis resembling that due to the tuberculous process.

**Pyogenic Microbes.**— Bauzet (*Th. de Paris*, No. 200, 1896) says that microbes are not indispensable to suppuration, which may be caused by filtered or sterilized cultures. Koch's bacillus is pyogenic, and may cause cold or acute abscesses, but a cold abscess is not necessarily tuberculous.

The streptococcus is the most common agent in acute septicemia and pyemia, and tends to produce most serious acute, diffuse processes; for example, phlegmonous and serous suppurations. It varies much in vitality and virulence, often becoming much more venomous, when other bacteria are present. The staphylococcus is much more stable; it gives rise to septicemia or pyemia of moderate severity, and to circumscribed abscesses in sebaceous glands and in cellular or bony tissue. Secondary infections by it are seldom very serious. To the pneumococcus we owe many suppurations — sometimes of a very serious nature — of serous membranes, joints, or middle ear. Eberth's bacillus, as a pyogenic microbe, is of secondary importance, but may cause subacute periostitis, without superficial lesions.

The bacillus coli ranks with the streptococcus and staphylococcus, and may produce acute, general, or various forms of local suppuration, urinary, biliary, peri-intestinal or salpingitis. Its suppurations are, however, much less acute, and are less prone to extension or to affect the general system than those caused by the pyogenic micrococci. The gonococcus has been proved to have pyogenetic properties only as regards the mucosa of the urethra, the conjunctiva, and the female genital organs.

**Micro-organisms in Chorea.**—Meyer (*Jahrbuch für Kinderheilk*, Vol. XI), after referring to the close clinical relationship which he found to exist between chorea and rheumatism, as shown in eighty per cent. of his own cases, refers to a fatal case of chorea in which a considerable number of pyogenic cocci were found in the blood and in various organs, including the brain. The same micro-organism has been found in the pathological products of acute articular rheumatism. It seems possible that this micro-organism may be the connecting link in the etiology of chorea and rheumatism.

**Bacteriological Examination in Diphtheria.**— The importance of a careful bacteriological examination in cases of diphtheria cannot be disputed. Nevertheless, the fact must be recognized that the clinical symptoms, as well as the results of bacteriological examination, must be considered in these cases. Drs. Hewlett and Nolan, two eminent London bacteriologists, report (*British Medical Journal*) that in one thousand cases investigated by them through specimens sent in for examination, two fifths, or four hundred, were negative as regards the presence of the diphtheria bacillus.

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## THE INFLUENCE OF ALCOHOLIC DRINKS UPON DIGESTION.

THE *American Journal of the Medical Sciences* contains, in the first four numbers of the present volume, 1896, a very interesting report made by Drs. Chittenden and Mendel upon "The Influence of Alcohol and Alcoholic Drinks upon the Chemical Processes of Digestion." This report was prepared by request, and presented to the Committee of Fifty for the Investigation of the Liquor Problem, at a meeting held in New York, May 3, 1895.

Few persons in this country are better prepared to undertake an investigation of this sort. Dr. Chittenden is professor of physiological chemistry in Yale University, and Dr. Mendel is instructor in physiological chemistry in the same institution. We are glad to note that the investigators have presented so full a statement of their work and of the methods employed. They very properly call attention to the fact that the study of the influence of alcohol or any other agent upon the chemical processes of the stomach alone cannot afford the necessary data upon which to base a proper conclusion respecting the actual influence of the agent investigated upon digestion, for the reason that "an agent which by its mere presence in the stomach contents, for example, is without direct action on the ferment, or even without influence when absorbed into the blood in the process of secretion, may indirectly influence digestion by either retarding or accelerating absorption. Further, the mechanical movements of the gastro-intestinal tube, *i. e.*, peristalsis, have their influence upon digestion, the solution of the proteid foods especially being facilitated by the vigorous churning to which the contents of the stomach and intestines are subjected under normal circumstances. The onward movement of the contents of the alimentary tract is likewise governed by the proper contraction of the longitudinal and circular muscular fibers of the intestine; and as all these muscles, both of the stomach and the intestine, are controlled by the nervous system, it follows that digestion may be somewhat modified through this channel, indirectly, to be sure, but to quite an appreciable extent. Hence certain agents, acting primarily upon the nervous system, may indirectly in this manner have an influence upon digestion without showing any special action upon the digestive enzymes, or upon the process of secretion or absorption."

The investigation was conducted by means of artificial digestive experiments, in which the digestive fluids were allowed to act upon various food substances under definite and constant conditions. Without going into the details of this investigation, we summarize a few of the interesting facts elicited respecting the influence of alcohol in various forms upon proteolysis, or the digestion of albumin and other proteid substances.

In nineteen experiments made with absolute alcohol, it was found that the relative amount of digestive action was increased a fraction of one per cent, in four. In these cases the amount of alcohol present did not exceed one or two per cent. In every instance in which the amount of alcohol exceeded two per

cent. there was a decided decrease in digestive activity. There was also a decrease in digestive action in six experiments in which the amount of alcohol was two per cent. or less; and in one instance three per cent. of alcohol reduced the digestive activity 17.6 per cent., while six per cent. diminished the digestive action more than one third, or 34.6 per cent.

The fact that the amount of digestive activity was increased a fraction of one per cent. in four instances might lead to the conclusion that in very small doses alcohol may increase digestive activity, were it not for the fact that in a larger number of cases the digestive action was diminished. In the four cases in which digestive action was increased, the average increase was a little less than .6 per cent., whereas, for the six experiments in which the amount of alcohol present varied from .5 to two per cent., the average percentage of decrease was 1.6. It is thus apparent that the average of the entire ten experiments would show a decided decrease of digestive activity, even when the amount of alcohol present was so small as two per cent. or less.

In twelve experiments made with pure rye whisky costing one dollar a quart, which contained fifty to fifty-one per cent. of alcohol, the results were found to be practically the same. So small an amount of whisky as one per cent. diminished the digestive activity in three experiments, and to the amount of 4.1 per cent. in one case, 3.7 per cent. in another, and 10.3 per cent. in still another,—an average of over six per cent. In three cases an increase of from .3 to .5 per cent. of the digestive activity was shown in the presence of whisky in the proportion of one to three per cent. In larger amounts the diminution of the digestive activity was very decided, amounting, in one case, to twenty-one per cent. with six per cent. whisky.

We can hardly understand how, in the presence of such facts, the investigators can be justified in the conclusion drawn: "Hence whisky can be considered to impede the solvent action of the gastric juice only when taken immoderately and in intoxicating quantities." Experiments made with brandy, rum, and gin gave practically identical results, one per cent. brandy producing in one experiment a diminution of 4.4 per cent. in digestive activity. Each of the experiments made with rum and gin showed decided diminution of digestive activity.

By these experiments it was also shown that fusel-oil, containing propyl, butyl, and amyl alcohols, produced the same effects as ethylic alcohol. In very small doses there appeared to be sometimes an increase in digestive activity, although in other experiments the digestive action was decidedly diminished, even when the fusel-oil was administered in so small a proportion as .25 per cent., the decrease in digestive activity in two instances amounting to 3.6 per cent.

It thus appears that if the experiments made with ethylic alcohol had proved it to be beneficial in its influence upon digestion, the same argument would hold good for fusel-oil. Hence, if alcohol is to be recommended as an aid to digestion, in small doses, consistency would suggest the propriety of choosing raw whisky and the cheaper grades of brandy rather than those liquors which have been thoroughly purged of their fusel-oil by redistillation or by long keeping.

After careful study of the report of Drs. Chittenden and Mendel as to the influence of alcohol upon proteid digestion, we are compelled to infer that alcohol, in all the forms and doses in which it is commonly employed, is detrimental to the digestive process, at least so far as it relates to the digestion of albumin. In this respect, the observations of Drs. Chittenden and Mendel agree with those of the writer made a number of years ago, in which it was found that so small an amount of

alcohol as that contained in two ounces of whisky added to an ordinary test meal, converted a case of decided hyperpepsia into a case of extreme apepsia. The following were the figures obtained : —

ORDINARY TEST BREAKFAST.

| | grms. |
|---|---|
| Total acidity | .240 |
| Total chlorin | .328 |
| Free HCl | .032 |
| Combined chlorin | .268 |
| Fixed chlorin | .098 |
| Coefficient | .77 |

ORDINARY TEST BREAKFAST WITH 2 OZS. OF BRANDY.

| | grms. |
|---|---|
| Total acidity | .016 |
| Total chlorin | .206 |
| Free HCl | .000 |
| Combined chlorin | .032 |
| Fixed chlorin | .172 |
| Coefficient | .47 |

From the above it is evident that it is an error to suppose that the proper means of determining the effects of alcohol upon digestion is by experiments performed by artificial digestive mixtures outside the body. Digestion in the flask is a very different thing from digestion in the stomach. Digestion in the stomach involves not only the so-called chemical action of the gastric juice, but also the formation of gastric juice. An agent which so paralyzes the activity of the gastric glands as to prevent the formation of gastric juice must necessarily be equally efficient in disturbing digestion with an agent which neutralizes or inhibits the action of the gastric juice after it has been formed. Professor Chittenden's experiments thoroughly show that alcohol most decidedly interferes with the paralytic or dissolving action of the gastric juice upon the food. My own experiments, the results of which are shown in the above table, and which I have many times confirmed by repeated observations upon different persons, show that alcohol prevents the formation of gastric juice in the stomach. Placing these two facts together, we find that alcohol, instead of being an aid to digestion, interferes with it in a most decided manner.

Dr. William Roberts concluded from the experiments which he made upon this subject, and which are referred to by the authors of the present investigation, that alcohol lessens the digestive activity. He nevertheless found an apology for its use in the very original hypothesis that the modern civilized man is suffering from excessive rather than diminished digestive activity, whereby, according to Dr. Roberts, he is exposed to a multitude of evils growing out of "an undue and dangerous acceleration of nutrition." Alcohol, according to Dr. Roberts, is valuable as a means of slowing down the dangerously active digestive process of the modern man.

The results recorded by J. W. Frazer and other investigators in this line agree entirely with my own observations and those of Dr. Roberts, and also with my interpretation of Dr. Chittenden's, and afford no evidence whatever that alcohol is in any way an aid to digestion, notwithstanding the enormous quantities of wine, beer, brandy, and other liquors which have been swallowed, both with and without the sanction of a physician's prescription, under the notion that the processes of digestion were thereby in some manner aided and facilitated.

Next month we will consider some further points in this interesting report.

## A NEW FOOD FOR DIABETICS.

UNTIL recently the almost universal prescription for persons suffering from diabetes has been a meat diet, it being well known that the leading symptom of this disease is the presence of sugar in the urine, which is aggravated by the use of starchy foods. Within the last few years, however, eminent French physicians have pointed out the fact that in the exclusive or free use of meat there is

great danger of so filling the system with a class of poisons which abound in meat, and which are known as leucomains and ptomains, as to produce death by diabetic coma, the first symptom of which is drowsiness, which rapidly increases until the patient passes into a condition of profound stupor, and dies.

Gluten derived from wheat, the nitrogenous principle of the Soja bean, and the casein of milk, have been substituted for meats with advantage. But the patient tires of these substances, which, by their means of production, are necessarily deprived of their natural flavors, and consequently do not appeal to the palate in an appetizing way.

As the result of a long series of expensive experiments and investigations, it has been found possible to prepare from nuts a food which answers perfectly the requirements of a person suffering from diabetes. This food, known as nuttose, closely resembles meat, both in its appearance and flavor. Its composition is as follows: —

| | |
|---|---|
| Proteids | 15. |
| Vegetable fat | 23.3 |

with a very small proportion of soluble starch and dextrin. It also contains an abundance of the salts, phosphates, etc., which accompany both vegetable and animal proteids, and hence is a perfect food. Nuttose is furnished in hermetically sealed cans, in which it will keep indefinitely. It may be opened at one end and the whole contents slipped out in the form of a solid roll, which may be cut in slices and eaten cold like roast beef or mutton, as it is thoroughly cooked; or the nuttose may be cut into cubes and stewed slowly in a double boiler, like beef or mutton, to which it has a remarkably close resemblance. Nuttose may be combined with tomatoes, cabbage, and other vegetables, although of course diabetics must avoid vegetables containing a large proportion of starch.

Nuttose being a complete food, produced in the laboratory of nature, and not a bungling artificial admixture of food elements gathered from various sources, it may be relied upon as a staple article of diet by diabetics. It is very digestible, especially when stewed. The large amount of fat which it contains renders it a most excellent means of combating the tendency to emaciation which exists with diabetics. The fat is in a state of perfect emulsion, and not in the form of free fat, as in butter, oils, and the fat of fat meats. On this account it is much less likely to disturb digestion than other fat-containing foods; and being of vegetable origin, it is wholly free from the poisonous elements which abound in meats of all kinds, and which render flesh foods, except in very small quantities, dangerous to patients suffering from diabetes.

Nuttose is equally well adapted to the use of persons suffering from Bright's disease, consumption, anemia, and all wasting diseases. It quickly dissolves in the stomach, contains no fibrous tissue, cartilage, or other substances, possessing in this respect the characteristic of a meat powder or meat pulp, from which all fibrous tissues have been carefully removed. Nuttose is likely to prove one of the most important articles which has recently been added to the list of food substances adapted to human stomachs.

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**Intestinal Asepsis.**— Since the publication of Bouchard's extraordinary work on "The Auto-Intoxications," the importance of intestinal asepsis has been more and more generally recognized, until at the present time it is barely possible that some may be even inclined to dwell too much on intestinal cleanliness as a factor in therapeutics. Certain it is, however, that intestinal antisepsis may become a means of aggravation to almost any malady, even though a causative relation may not be distinctly traceable.

There has been much discussion as to

the best means of securing intestinal asepsis. Very naturally the first appeal is made to various antiseptic drugs, such as naphthol, salol, salicylate of bismuth, creosote, chloroform, and other drugs capable of preventing the development of microbes. The difficulty, however, is at once encountered, that drugs capable of thoroughly disinfecting the alimentary canal are also capable of doing serious mischief to the body, especially the kidneys, liver, and other organs of elimination. There has consequently been a general tendency to reaction against the use of antiseptics, and some have gone so far as to denounce them as not only absolutely useless but decidedly harmful. From the writer's own experience he has been inclined to agree with Bouchard, the eminent French physician, who discards antiseptics almost altogether, and resorts to the use of water as a cleansing agent, in connection with a proper dietary. Water is administered in the form of a coloclyster, by the aid of a long rectal tube, sometimes as much as six quarts of water being introduced, it being made, in some cases, to traverse the whole length of the alimentary canal, finding its exit from the mouth.

For many years the writer has employed the coloclyster (which consists of a large enema taken in the knee-chest position in such a manner as to fill the whole colon) with most excellent results, having frequently employed the enema in cases of uremic poisoning which seemed to be absolutely hopeless, with the result of seeing the patient make a good recovery. His experience also accords with that of Huchard, who claims to have found the large warm enema the best of all diuretics.

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EGYPT is threatened with a general outbreak of cholera. The residents of Alexandria and Cairo are rapidly fleeing to more healthful localities.

# REVIEWS.

MATERIA MEDICA AND THERAPEUTICS.— A practical treatise with especial reference to the clinical application of drugs. By John V. Shoemaker, A. M., M. D., LL. D., professor of materia medica, pharmacology, therapeutics, and clinical medicine, and clinical professor of diseases of the skin in the Medico-Chirurgical College of Philadelphia; physician to the Medico-Chirurgical Hospital, Philadelphia, etc. Third edition, thoroughly revised. Reset with new type and printed from new electrotype plates. Royal octavo. Extra cloth, $5 net; sheep, $5.75 net. Philadelphia: The F. A. Davis Co., Publishers, 1914 and 1916 Cherry Street.

This compendious work, like all Dr. Shoemaker's writings, is a model of clearness in expression, fulness in detail, and perfect elaboration. It brings the subject of materia medica and therapeutics in relation to drugs, up to date. In addition, it devotes more than 200 pages to non-pharmaceutical medicine and expedients not classed with drugs, in which electro-therapeutics, massage, rest-cure, pneumotherapy, hydrotherapy, climatology, and dietetics all receive attention. The work is one which will commend itself to intelligent practitioners and medical teachers.

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SYLLABUS OF LECTURES ON HUMAN EMBRYOLOGY: AN INTRODUCTION TO THE STUDY OF OBSTETRICS AND GYNECOLOGY.— For medical students and practitioners. With a glossary of embryological terms. By Walter Porter Manton, M. D., professor of clinical gynecology and lecturer on obstetrics in the Detroit College of Medicine; fellow of the Royal Microscopical Society, of the British Zoological Society, American Microscopical Society, etc. Illustrated with seventy (70) outline drawings and photo-engravings. 12mo., cloth, 126 pages, interleaved for adding notes and other illustrations, $1.25 net. Philadelphia: The F. A. Davis Co., Publishers, 1914 and 1916 Cherry Street.

Dr. Manton has produced, in this little work, a hand-book admirably calculated to assist students in the study of one of the most fascinating, yet one of the most difficult, of all subjects presented to the student of medicine. The work is profusely illustrated with admirable and useful cuts. The entire volume is interleaved with blank leaves for the convenience of the student, and by means of specimen outlines of what is to be seen, the student is greatly aided in the use of his pencil in fixing upon paper the results of his observations.

# The Battle Creek Sanitarium
# LABORATORY OF HYGIENE.

J. H. KELLOGG, M. D., Superintendent.
GEO. H. HEALD, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
A. B. OLSEN, B. S., M. D., Pathologist.
W. A. GEORGE, M. D., Chemist.

**Monthly Résumé of Work Done.**

## REPORT OF EXAMINATION OF BLOOD.

FOR JULY.

| Blood Count. | Men. | Women. | Total. |
|---|---|---|---|
| Over 5,000,000 | 41 | 6 | 47 |
| Between 4,500,000 and 5,000,000 | 48 | 36 | 84 |
| " 4,000,000 " 4,500,000 | 14 | 47 | 61 |
| " 3,500,000 " 4,000,000 | 2 | 11 | 13 |
| " 3,000,000 " 3,500,000 | 2 | 1 | 3 |
| " 1,500,000 " 2,000,000 | 2 | 0 | 2 |
| Totals | 109 | 101 | 210 |

| Hemoglobin. | Men. | Women. | Total. |
|---|---|---|---|
| 100 per cent. | 61 | 40 | 101 |
| 93 " " | 38 | 45 | 83 |
| 86 " " | 10 | 5 | 15 |
| 79 " " | 4 | 0 | 4 |
| 71 " " | 2 | 1 | 3 |
| 63 " " | 2 | 3 | 5 |
| 55 " " | 1 | 0 | 1 |
| Totals | 118 | 94 | 212 |

**Gastric Laboratory Report for July.**— Regular chemical analysis of the stomach fluid was made in 225 cases, 24 of which were experimental.

The patients were from twenty-seven States, as follows: Michigan, 50; Illinois, 35; Ohio, 19; Wisconsin, 10; Texas, 10; Indiana, 10; Kentucky, 8; Iowa, 7; Pennsylvania, 7; Tennessee, 6; Missouri, 6; Kansas, 6; Minnesota, 6; New York, 3; Montana, 3; Vermont, 2; Louisiana, 2; Nebraska, 2; New Jersey, 1; Dakota, 1; Massachusetts, 1; Mississippi, 1; Maryland, 1; West Virginia, 1; California, 1; Alabama, 1; Ontario, 2.

**Bacteriological Report of Stomach Fluids for July.**— Total number of fluids examined, 241; regular, 210; experimental, 31.

**Microscopical Examination of Sputum for July.**— Total number of examinations made, 60; new cases, 46. Number of cases in which tubercular bacilli were found, 10; new cases, 8. The patients were from the following States: Michigan, 4; Alabama, 2; Iowa, 1; Minnesota, 1.

**Urinalysis Report for July.**— Number of specimens examined, 432; number of cases, 321. Number of cases with pus, 72; albumin, 25; blood, 2; sugar, 8; bile, 11; casts, 6. Number of specimens tested for toxicity, 19; number of cases tested for toxicity, 14.

# PUBLISHERS' DEPARTMENT.

PEROXIDE OF HYDROGEN.— Dr. Warren Brown, of Tacoma, Washington, recommends peroxide of hydrogen for gonorrhea, cystitis, purulent inflammation of the eye, ulcerations of all sorts, empyema, tonsillitis, diphtheria, atrophic rhinitis, eczema of the anus, cleansing of mammary abscesses, cleansing of the cervix uteri before applications, and for cleansing of abscesses of all sorts. He finds hydrozone equally satisfactory with peroxide of hydrogen. Dr. Robert Morris recommends peroxide for cleansing the abscess cavity in appendicitis. In using peroxide for atrophic rhinitis or ozena, it should be used in the form of a spray, 40 per cent. strength, a few minutes before the application of the alkaline spray for the removal of scabs, to help the solution of scabs, and to destroy the foul odor.

---

THE Colorado Sanitarium, at Boulder, Colo., was dedicated July 1, with appropriate ceremonies, and the following program: —

Anthem.....Hear our Prayer, O Lord.
Introductory Remarks.....A. R. Henry.
Prayer .....Rev. A. H. Tevis.
Anthem.....Light of the World.
Addresses — Mayor Ricketts, Rev. O. A. Olsen, Rev. A. H. Tevis, Hon. James P. Maxwell, J. H. Kellogg, M. D.
Anthem.....God Be Merciful.
Benediction.....F. M. Wilcox, Chaplain.
..... .....Inspection of Building/..... .....

At a meeting of the local board held in connection with the dedication, several important steps were taken, among which may be mentioned the organization of the faculty, with Dr. W. H. Riley as chairman, and also a managing committee.

The next day after the dedication, by the courtesy of Dr. Place, the visitors enjoyed a mountain ride through Sunshine and Boulder cañons. There are but few localities which present such a variety of interesting and romantic mountain scenery as Boulder.

Although just opened, the main building of the institution is nearly filled with patients. The appliances for treatment are not yet completed, but are being rapidly gotten into complete readiness, so that efficient work is already being done.

We think it may be said without exaggeration that at the present time there is no other place in the world where a consumptive can have so excellent an opportunity for recovery as at the Colorado Sanitarium. The invalid under treatment at this institution enjoys not only the advantages of the unrivaled climate of the Rocky Mountain region, but the benefit of all the facilities for the medical management of pulmonary ailments known to modern medical science. The mile-high climate of Boulder is one of essential value in the treatment of tubercular disease of the lungs. It is at the same time a highly beneficial adjuvant in the management of a large number of chronic ailments, especially disorders of the stomach and liver.

Dr. Place has worked earnestly and successfully in building up the work at Boulder; and in leaving that work to take charge of a pioneer medical mission in India, he will be missed by a multitude of friends, many of whom expressed themselves as quite unreconciled to his leaving the work which has been so rapidly and successfully developed under his care.

By vote of the local board of managers, in compliance with the recommendation of the Medical Missionary Board, the faculty of the Colorado Sanitarium was increased by the addition of Drs. W. H. Riley, Kate Lindsay, G. W. Burleigh, and Mrs. D. W. Read. There is an exceedingly hopeful outlook for a successful and useful future for the Colorado Sanitarium.

# DIRECTORY OF SANITARIUMS.

THE following institutions are conducted under the same general management as the Sanitarium at Battle Creek, Mich., which has long been known as the most thoroughly equipped sanitary establishment in the United States. The same rational and physiological principles relative to the treatment of disease are recognized at these institutions as at the Battle Creek Sanitarium, and they are conducted on the same general plan. Both medical and surgical cases are received at all of them. Each one possesses special advantages due to locality or other characteristic features.

## ST. HELENA SANITARIUM, OR RURAL HEALTH RETREAT,

ST. HELENA, CAL.

W. H. MAXSON, M D., Superintendent.
IRVING E. KECK, Business Manager.

THIS institution is beautifully located at the head of the Napa Valley. It is a fine large building, with excellent appointments, and all facilities required for the treatment of chronic invalids of all classes. It has also a record for a large amount of successful surgical work. There are several able physicians connected with the institution. The scenery is delightful, the climate salubrious; the water supply, which is furnished by mountain springs, is pure and abundant. Hundreds of cases of diseases generally considered incurable have been successfully treated at this excellent institution during the twenty years of its existence.

## CHICAGO SANITARIUM,

28 COLLEGE PLACE, CHICAGO, ILL.

THIS institution is a branch of the Battle Creek (Mich.) Sanitarium. It is favorably located near Lake Michigan, in the southern portion of the city, close to Cottage Grove avenue, and facing the old Baptist University grounds. A few patients are accommodated. Facilities are afforded for hydrotherapy, and the application of massage, electricity, Swedish movements, and other rational measures of treatment.

## NEBRASKA SANITARIUM,

COLLEGE VIEW (LINCOLN), NEB.

A. R. HENRY, President.
A. N. LOPER, M. D., Superintendent.

COLLEGE VIEW is a thriving village located in the suburbs of Lincoln, with which it is connected by an electric railway. College View is the seat of Union College, one of the leading educational institutions of the West. The Sanitarium has a beautiful location, facing the spacious college grounds, and gives its guests the advantages of a quiet, homelike place, combined with appropriate and thoroughly rational treatment. It has a full equipment of excellent nurses, and has already won for itself an enviable reputation in the West.

## PORTLAND SANITARIUM,

PORTLAND, ORE.

L. J BELKNAP, M. D., Superintendent.

THIS institution is beautifully located in the center of the city, in a fine building with spacious grounds; and although it has been in operation scarcely more than a year, it already has a good patronage, and has evidently entered upon a successful career. Facilities are provided for the dietetic and medical treatment of chronic ailments of all kinds. The advantages for treatment include, in addition to various forms of hydrotherapy, electric-light baths, and apparatus for the application of electricity in its various useful forms, manual Swedish movements and massage.

## COLORADO SANITARIUM,

BOULDER, COLO.

O. G. PLACE, M. D., Superintendent.

THIS institution is located on a beautiful site of one hundred acres, including a fine mountain peak, and commanding extensive landscape views which, for variety and beauty, can hardly be equaled. The site adjoins the thriving city of Boulder, and is about one hour's ride by rail from Denver, the streets and principal buildings of which are easily discernible from the peaks around Boulder. The equipment consists of a large building especially erected for the purpose, two fine cottages, and every appliance for the application of hydrotherapy, and for the special treatment of pulmonary ailments, to be found in the best establishments of like character. Particular attention is given to the dietetic treatment of patients, and to systematic exercise, in addition to the special treatment for specific ailments. The altitude is between five and six thousand

# Directory of Sanitariums.—Continued.

feet, just that which has been determined to be the best for pulmonary troubles. Though but a few months have elapsed since the work of this institution was fairly begun, a large number of persons suffering from pulmonary tuberculosis have already been cured, and are now rejoicing in sound health. The rational hygienic treatment, with the climatic advantages, has proved effective in the cure of cases which, without the combined advantages of these superior measures, must certainly have succumbed to the disease.

## GUADALAJARA SANITARIUM,

STATE OF JALISCO, MEXICO.

D. T. JONES, Superintendent.

ADDIE C. JOHNSON, M. D., J. H. NEALL, M. D., } Physicians.

THIS institution, established in 1894, is the first and still the only one of the kind in Mexico. It affords, in addition to the unsurpassed climatic advantages of the region in which it is located, facilities for the employment of hydrotherapy, electricity, massage, manual Swedish movements, and dietetics, in the treatment of all forms of chronic disease. The altitude is the same as that of Denver,—from five to six thousand feet. Guadalajara has the advantage of a climate more nearly uniform than any other with which we are acquainted. Located in the tropics, it enjoys almost perpetual sunshine, while its altitude is such as to prevent excessive heat. There is probably no better place on earth for a pulmonary invalid. It is only necessary that the advantages of this institution should become known to secure for it extensive patronage.

## INSTITUTE SANITARE,

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THIS institution affords the only place in Europe where patients can receive the advantages of a thoroughly hygienic diet, baths, electricity, Swedish movements, massage, and various other methods of treatment, applied after the manner and in accordance with the same principles which govern the Battle Creek Sanitarium and its several branches. The physicians are persons who have received a thorough training in the institution at Battle Creek. Terms are moderate. No better place for sick persons or semi-invalids abroad than the Institute Sanitare.

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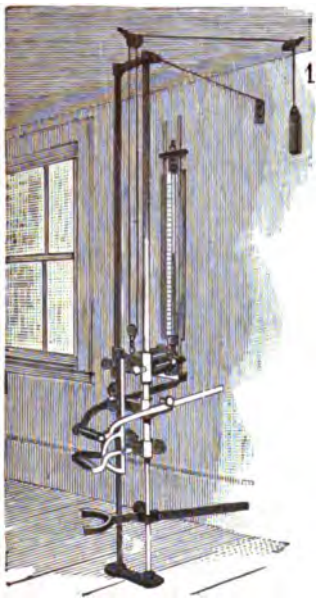

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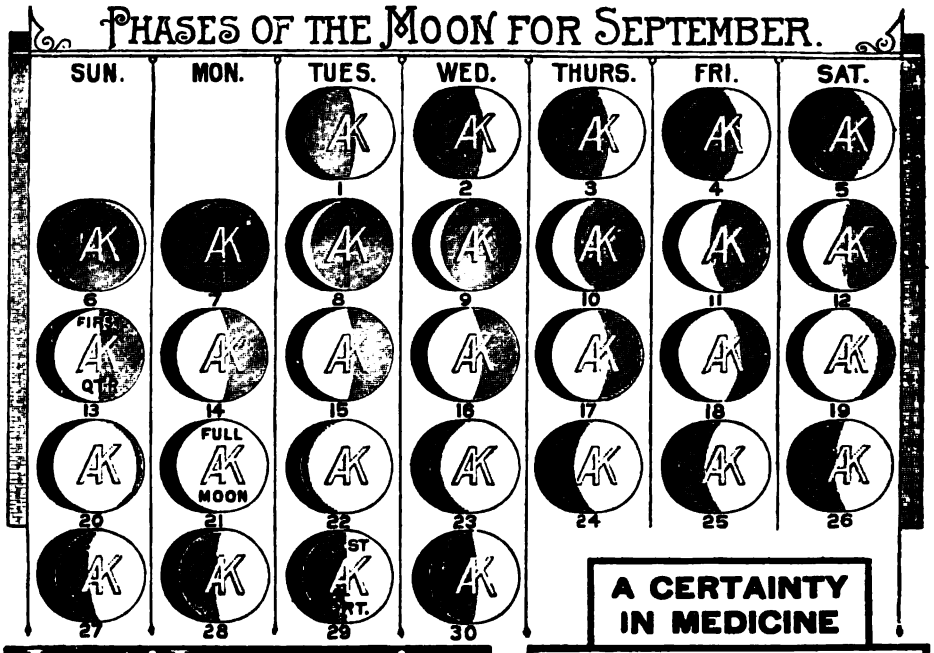


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# MODERN MEDICINE

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## BACTERIOLOGICAL REVIEW.

VOL. V. BATTLE CREEK, MICH., U. S. A., SEPTEMBER, 1896. NO. 9.


## ORIGINAL ARTICLES.

### SCOLIOSIS AND ITS TREATMENT BY MEANS OF GYMNASTICS.


BY DR. T. J. HARTELIUS.

Translated by Dr. David Paulson.


#### DEFINITIONS AND SUBDIVISIONS.

PERMANENT lateral curvature of the spinal column is termed scoliosis. If this condition is the result of a primary affection of the muscles, it is called *scoliosis muscularis;* if it results from a primary affection of the bones, it is called *scoliosis ossicularis.* It is clear that, whether the first cause lies in the muscles or in the bones, disease of the bones or muscles will follow secondarily, if the primary affection is not removed. If the classification of cases of scoliosis were based upon its primary cause, a new classification would have to be made; because there are a number of diseases which give rise to this condition. Disease in the vertebral cartilages or in the ligaments may produce it, or it may result from pleuritic exudate. But as it is only occasionally that scoliosis arises from these causes, such a classification would be of but little value for the correct comprehension of the disease. The only classification which is necessary is to consider it under the two heads above mentioned,— muscular scoliosis and ossicular scoliosis.

#### SYMPTOMS, COURSE, AND PATHOLOGICAL AND ANATOMICAL CHANGES

Scoliosis is so insidious in its early stages that its first signs are often unnoticed. It is, however, important that these should not be overlooked; for, in order to prevent its progress, it is necessary to treat it in the beginning. The least asymmetry in the position of the shoulders or the hips should suggest the importance of an examination to find out if there is not an incipient deviation from the normal in some portion of the spinal column. Of course it is possible that the shoulders as well as the hips may, from mechanical causes or disease, have an abnormal position without being connected with an incipient scoliosis. This, however, may be readily detected by examination. Careful examination by means of sight, measurement of the trunk, of the extremities, and of corresponding parts, should readily lead to the detection of scoliosis, even in its earliest stages.

Some authors, as Jalade-Lafond, Büring, Bouvier, Sabatier, and others, hold the opinion that there is, in certain individuals, a physiological right lateral curvature. Hyrtl accepts this idea, but considers the deviation so minute that only a trained eye can detect it. Sabatier and Jalade-Lafond consider the pulsations of the descending aorta as a cause for this curvature, while Büring considers the heart-beat as the cause. I have not been able to establish the presence of such a curvature, although I have had under observation a large number of students, furnishing abundant material for investigation. There are, however, noted authors who oppose the idea that such a curvature exists. M. Eulenburg denies it in the most decided manner, and says that every permanent lateral curvature must be considered as pathological.

Scoliosis is quite regular in its course of development, which, from a pathological point of view, may properly be divided into three stages. When a curvature first appears in any part of the spinal column, or, as is most common,

in the dorsal or lumbar region, it is in its first stage. The characteristic symptom of this stage is that the patient can voluntarily assume an erect poise, the curvature also disappearing when he takes a horizontal position. The patient is able to maintain the spinal column erect, however, only for a short time, and hence he will very soon resume his former position. The curvature is pathological, and there is no good ground for calling this stage a mere *tendency* to scoliosis.

A primary curvature is sooner or later followed by a compensation curvature, when the scoliosis may be said to have entered its second stage, and the curvature has become S-shaped. Not rarely there also occurs a compensating curvature in the neck and sacral region, so that the spinal column forms a wave-like curve laterally, which is commonly longest and deepest in the dorsal region. Frequently, however, there occurs a primary dorsal or lumbar curve with the convexity to the left, which may exist for some time without any noticeable compensation curve. In practise, the latter are considered and treated as single curvatures. The single curvature is, however, more apparent than real; because, upon thorough examination, there will commonly be found a counter-curve either in the neck or the sacral region, or in both. The characteristic of the second stage of scoliosis is the rotation of the vertebral bodies on their long axes, with the spinous processes toward the concave side, and the bodies toward the convex side. In a permanent lateral curvature, the rotation of the vertebral bodies is accompanied by a change in their form and in the form of the vertebral cartilages, as well as in the relative position of the ribs, clavicle, and shoulder-blade.

With this deformity, scoliosis has reached its third stage, but it will develop further if it is allowed to proceed. The length of time necessary for it to develop differs in different individuals, and undoubtedly depends partly upon the surroundings, and partly upon the difference in the quality of the vertebral cartilages and bony substances of the vertebræ. The degree of the spinal curvature determines, of course, the degree of deformity in the adjacent parts.

The characteristics of this deformity, and the pathological changes in scoliosis, as observed by Cruveillier, furnish interesting information. A post-mortem examination was made upon a scoliotic spinal column, with the convex side to the right from the third to the eleventh dorsal cartilages, which presented the following deviations: The bodies on the convex side measured 222 millimeters in height, and on the concave, 215, the difference between the two sides being seven millimeters. The height of the first eight vertebral cartilages upon the concave side was forty-five millimeters, and upon the convex side, sixty-five, thus showing a difference of twenty millimeters. The ninth, tenth, and eleventh dorsal vertebræ were all of equal height on both sides. On the contrary, however, the corresponding vertebral cartilages were, on the convex side, twenty-eight millimeters, and on the concave side only sixteen millimeters in height. The proportion existing between the height of the vertebral bodies on the concave side and that on the convex side was as 9 is to 10, and the proportion existing between the height of the vertebral cartilages was as 5 is to 10. The deformity in the lumbar curve upon the same body was yet more apparent. The height of the vertebral cartilages on the concave side was to the height on the convex side in the proportion of 6 to 18. In the corresponding vertebral bodies, the height of the concave as compared with the convex side was in the proportion of 17 to 19. The cartilages between the second and third lumbar vertebræ had entirely disappeared upon the concave side, and the two vertebral bodies were completely ankylosed.

This case shows that in the advanced stages of curvature a wedge-shaped change takes place, first in the vertebral cartilages, and later, on account of the pressure, in the vertebral bodies. The greatest deformity takes place in those vertebral cartilages and bodies which form the center of the pathological curvature, and decreases gradually toward the ends of the curve.

Dr. Eulenburg says that post-mortem examinations establish the fact that in well-marked lateral curvatures, where the vertebral cartilages have been absent for some time, there often arises an ankylosis of the vertebral bodies through synostosis, or ossification.

Accompanying the lateral curvature of the spinal column is a necessary change

in the normal position of the ribs. Upon the convex side they protrude, and through a marked bending and rotation of the vertebræ they often acquire an arched appearance, as though there were a complication of kyphosis; but this is not really the case. The ribs arch out at their vertebral ends, and are separated from each other and flattened upon their sternal ends. The opposite condition is found in the ribs upon the concave side, which, on their vertebral ends, are crowded nearer together, flattened, and often synostosed. On the sternal ends they arch forward. A scoliotic thorax, however, differs from the regular thorax of diminished capacity.

A counter-curve in the lumbar region contributes also to the diminishing of the chest capacity, through the pushing up of the false ribs upon the convex side. In rachitic scoliosis existing in a high degree, the ribs and the costal cartilages are usually depressed so that the sternum protrudes, presenting the characteristic "pigeon breast."

A very conspicuous abnormal position of the shoulders takes place in scoliosis. Upon the convex side, the shoulder-blade is generally higher, its lower angle protruding; on the concave side, it is lower, and, as it were, pushed forward upon the ribs. In treatment, it is very important to differentiate this mechanical dislocation of the shoulder-blade from one which is dependent upon a pathological condition of the muscles, which may often be complicated with scoliosis.

The form of the pelvis undergoes certain changes in scoliosis. Every marked lumbar curvature causes an elevation of the same side of the pelvis as the concavity, and a depression upon the opposite side. Various pathologico-anatomical changes in the muscles also arise in scoliosis. These may differ much in degree and extent. In the treatment of scoliosis, it is of the greatest importance to understand these changes. In support of this opinion, I will quote several authors: —

J. Delpech says: "The muscles which are situated upon the concave side in spinal curvature show a kind of hypertrophy, and those upon the convex side, a real atrophy."

M. Eulenburg quotes Professor Günther as having found the muscles in scoliosis on the convex side relaxed, of a pale color, and poorly nourished; those upon the concave side shortened, though not retracted, of the proper color, of normal nutrition, and capable of extension.

Dr. Bouland, in the post-mortem examination of a man forty-five years of age who had been afflicted with rachitic scoliosis, found the muscles upon the convex side thin, pale, and mixed with a considerable amount of fibro-cellular substance in connection with the muscle substance. In numerous places in those muscles, fatty degeneration had set in; the muscle fibers showed a large number of fine granulations under microscopical examination. The cross-striæ were absent in some of the muscle groups; upon the concave side the muscle groups were firmer, shortened, of normal color, and capable of relaxation.

M. Eulenburg examined the muscles of the body of a scoliotic girl aged eleven, who had died of an acute disease. The scoliosis had begun three years previously, and had reached the beginning of the third stage; viz., "an upper curve, with the convexity to the right from the third to the ninth dorsal cartilages." The highest departure from the median line, in the convexity, was two centimeters. In the lower curve, with the convexity to the left, involving the twelfth dorsal and all the lumbar vertebræ, the distance from the median line to the highest point of convexity was one and one-fourth centimeters. All the pathognomonic signs of rachitis were absent. Examination of the muscles showed the following: Upon the convex side, the longissimus dorsi and the multifidæ spinæ were pale in color, poorly nourished, and relaxed. The corresponding muscles upon the concave side of both curves were shortened, though capable of relaxation, and of nearly normal size and very slightly diminished color. The rhomboidal muscle upon the right side was more poorly nourished and paler than that upon the left side. Upon neither side was there any fatty degeneration of the muscles.

It is beyond all doubt that the muscles are weakened upon the convex side in scoliosis. We have a further confirmation of this in a similar condition in other abnormal conditions, such as pes equinus varus and valgus. Dittel says that in these abnormalities he has constantly found that the muscles of the convex side are pale, poorly nourished, with partial fatty degeneration, and relaxed,

while those of the concave side are contracted, better nourished, and nearly normal in color. The highest degree of deformity and disproportion between the two sides has been pointed out by Engel, who named it "paralytic thorax." Here, not only the skeleton and muscles undergo great changes, but there is also a displacement, and functional disturbances are set up in the circulatory, respiratory, and digestive organs (Bouvier).

So far as the influence of scoliosis upon the general health is considered, it may be said that it is usually not disturbed in the first stages by the local affection, and it is not unusual to find the health maintained, even in the more marked types of scoliosis.

It has been believed, and many have consoled themselves with the idea, that a scoliosis should, at least in its early stages, correct itself. This is directly opposed to experience, and the real truth, which cannot be denied, is that a well-defined scoliosis never of its own accord returns to a normal state; much less can this be expected in the more advanced stages. The other question is, Does the scoliosis, of its own accord, remain in one of its stages without further development? This has happened, and not infrequently occurs under favorable conditions; but it being entirely uncertain that such will be the case, not to seek help as soon as the scoliosis appears is an unjustifiable neglect.

Scoliosis proceeds with quite definite and characteristic symptoms. In 574 cases of the S-form of scoliosis, only five had the upper convexity on the left, and the lower convexity on the right. The remainder had the upper and greater curvature to the right, and the lower to the left. The upper curvature generally limits itself to the dorsal vertebræ, while the lower is confined to the lumbar vertebræ; and only in a very few cases did the lower dorsal vertebræ help to form the lower curve. Occasionally there could be found, in addition to the greater curvature, a smaller one in the cervical or the sacral region, or in both.

In 326 cases the spinal column had only the single, well-defined curve, but in a number there were found slight indications of a secondary counter-curve. The secondary curve follows the primary in a greater or less time, but not infrequently the single curvature may remain alone for a considerable length of time. The secondary curve is most commonly limited to the lumbar vertebræ, but occasionally involves several of the dorsal vertebræ. In these cases the curve will be of considerable length, although not very well marked as to depth. Of 326 cases, 280 had the curvature to the left, and where an indication to a counter-curve could be observed, it was to the right, and would thus, when fully developed, usually take the S-form. In forty-six cases a counter-curvature with a convexity to the right had set in.

From an observation of nine hundred cases of scoliosis, it appears that the prevailing types are of the S-form, with the upper convexity to the right and the lower to the left, and that other types may be considered as being merely exceptions to this rule. Even though the curvature may not seem to progress at some of the different stages of its development, yet it manifests a decided tendency to progress into the more advanced stages, with more or less pathologico-anatomical changes.

### THE CAUSES OF SCOLIOSIS.

The definite and quite similar symptoms in different cases of scoliosis readily lead us to the conclusion, with reference to its causes, that there must be a similar uniformity with reference to the mode of operation of its causes; yet there are many conflicting opinions in regard to this question. These different opinions seem to arise from the fact that some consider that the passive parts of the body, as the bones, cartilages, and ligaments, contribute chiefly to the maintenance of the erect position of the spinal column: while other authors maintain that the shape of the vertebral bodies, together with cohesion and gravity, is the principal agent in the maintenance of the vertebral bodies in a vertical position. None of the authorities thus exclude the activity of the muscles, but they give it a subordinate place. Dr. Parow limits the influence of the muscular activity to merely bringing the point of gravity into a position of equilibrium, and then considers further activity of the muscles to be unnecessary. In proof of this idea, he refers to experiments which show that the very least force that can be exerted is sufficient to maintain the equilibrium of the spinal column,—simply the sup-

port of one finger. M. Eulenburg remarks that it is improper to apply to the living organism conclusions drawn from experiments made upon dead bodies.

The idea that the maintenance of the correct position of the spinal column is for the most part naturally mechanical, leads to the conclusion that the changes in the passive parts, as the vertebral cartilages and bodies and the ligaments, should be properly considered as the primary cause of scoliosis. To assign such a subordinate place to the activity of the muscular system, conflicts, however, with every-day experience. Why does the feeble person relax, if not as the result of the weakened muscles? The aged person is not able to maintain an erect position because his muscular power is weakened. Vigorous persons, on the other hand, maintain themselves erect by the strength of their muscles; and whatever part the shape of the vertebral bodies, their gravity or cohesion, may play in the maintenance of this attitude, active and vigorous muscles are essential. A human being is, after a night's rest, several lines taller than he was the previous evening, after having, during the course of the day, wearied his muscles by the day's activities. It would be a strange inconsistency if the muscles, with their greater relative function and higher physiological rank in other respects, should contribute so little to the support of the spinal column. They have, moreover, for this purpose, the most suitable arrangement and compensation with the spinal column and trunk.

That it is the muscles which principally uphold and maintain the spinal column in the upright position is an opinion supported by many eminent authors. Hyrtl says that as long as the muscles retain their physiological antagonism in acting upon the spinal column, so long is a permanent spinal curvature excluded. M. Eulenburg declares that the cause of scoliosis most frequently consists of a derangement of the equilibrium between the muscles of the opposite sides. A similar opinion is held by Joannes Müller, Wallentin, Lachais, Axel Ulrich, A. G. Berglind, and others. C. A. Wunderlichs states the cause of scoliosis as follows: —

"The primary cause for deviation of the spinal column may be —

"1. An anomaly in the vertebral bodies with reference to their number, origin, or structure, or their shape and consistency. This condition may be congenital, or it may be acquired through a number of different diseases, as suppurative inflammation, osteomalacia, and rarely, rachitis.

"2. In the vertebral cartilages, though rarely.

"3. Changes in the bony substances of the vertebral bodies, as deposits, necrosis, and softening.

"4. In the muscles of the back, partly through contraction, partly through paralysis of single muscles, but chiefly through the difference in power and function of corresponding muscles of the two sides."

The same author gives the following explanation for the muscular cause of scoliosis: —

"The difference in the activity of the muscles of one side, as compared with that of the other side, though very slight, will yet exert a bearing on the position of the vertebral bodies, and this will be the more marked in proportion as one side is weaker than the other. This cause for spinal deviation is one of those which occur most frequently. Lateral curvature of the spine develops very readily in individuals who have weak muscular powers, and likewise in those who do not exercise their muscles sufficiently, especially those whose bodies have not reached full development. Therefore curvatures develop in the greatest number of cases before the time when growth takes place most rapidly, and while the muscles are comparatively thin; that is, from the time of the second dentition to puberty. It is on this account that deviation from the spinal column occurs so commonly in women, and for the same reason that spinal curvatures are so rapidly formed in childhood in the case of such diseases as retard the movements, and thus the activity and nutrition of the muscles. In rachitis the curvature is not dependent upon the change of form in the vertebræ, but upon the weakened, inactive condition of the muscles. In close connection with this cause is the relaxed and careless poise of the body often acquired, either through habit or lack of training."

This lengthy quotation is given because it throws a clear and definite light upon the etiology of scoliosis.

Many different causes have been proposed by different authors for scoliosis, but I shall herewith present only those which, on account of my own observation, seem to me the most scientific.

*Hereditary Tendency.*— If due to heredity, the curvature will develop not merely in weak individuals, but also in those who have a vigorous constitution. Some examples have been found where scoliosis in the same form has existed in the daughter, mother, and grandmother. It seems to be a fact that this hereditary tendency is transmitted chiefly on the mother's side. This is undoubtedly true in a great many more cases than it is possible to observe. Out of 1000 scoliotic cases, M. Eulenburg found 254 in which a hereditary disposition could be traced; and of these, 249 were transmitted from the mother's side, and only five from the father's. The author remarks with all assurance that twenty-five per cent. would hardly cover the whole number, as it is embarrassing to acknowledge a deformity in the back. This hereditary tendency is simply a disposition, and is not in itself a cause of scoliosis; the usual spinal curvature indicates a definite, active cause.

*Rachitis.*— This disease indicates a general disturbance of nutrition, and is characterized by progressive changes in the structure, composition, and form of the bones. On account of a relative excess in amount of the organic substance of the bones, they acquire an abnormal flexibility. That in this should lie a disposition to scoliosis is plain; but long bones, not the vertebral bodies, are the parts specially affected in rachitis. Among 496 rachitic children, Jules Guerin found only eleven without a deformity of any kind in the extremities; and of the remaining 485, the deformity was found in the spinal column in only forty-eight cases. Rachitis is a disease which very rarely occurs after the age of six or seven years, while the largest number of scolioses begin after this age. The rachitic disposition is strictly limited to childhood.

*Muscular Weakness.*— That weakness in the muscles, in and of itself, is the cause of scoliosis, is quite plainly denied by the typical form of the common curvature; but that it is more readily acquired in individuals whose muscles are weak is confirmed by experience, a certain disposition to scoliosis lying unquestionably in weakness of the muscles. Though the majority of scoliotic patients are weak in the muscles, this is not always the case. The great difference in the number of scolioses in the two sexes shows clearly a stronger tendency to it in one sex than in the other. In my own practise, the number of scoliotic cases in men as compared with those in women, has been in the proportion of one to nine. M. Eulenburg found scoliosis in ten women to one man. This greater tendency in women toward scoliosis may well have an explanation in their peculiar physical constitution, and also in the lack of vigorous strengthening bodily exercises.

*A Normal Lateral Curvature of the Spine.*— This curvature has its explanation, according to several authors, in the influence which the heart and aorta have upon the spinal column. It is, however, a hypothetical curvature, as to the existence of which there must be great doubt, as shown by extensive observations. If such a physiological curve really exists, it would of course give a certain disposition to a pathological curve.

Scrofula is given by some authors as a conducive cause of scoliosis. This, however, is contrary to my experience. After many years' treatment of scrofulous patients by medical gymnastics, it has not appeared to me that scoliosis is more common in individuals who have this disease than among others. This observation is borne out by the experience of H. Sätherberg and M. Eulenburg. The latter author says that scrofula does not seem in itself to give more of a tendency to scoliosis than to pes varus, genu valgum, torticollis, and strabismus.

*Swelling of the Vertebral Cartilages and Pathological Relation of the Ligaments of the Spinal Column.*— Delpech, with numerous other authors, takes the ground that swelling of the vertebral cartilages may give rise to scoliosis. On this, H. Sätherberg remarks that such a swelling might occur, but those who seek a cause in this for the appearance of scoliosis must also explain why the vertebral cartilages swell only upon one side and in a peculiar way, those in the dorsal region swelling upon the right side and in the lumbar region upon the left side, a condition existing in a great majority of cases of double curvature.

As opposed to the opinion of W. Adams

and Malgaine, who considered the cause of scoliosis to be in the spinal ligaments, the same remark may also be made.

*Pleuritic Exudate.* — This has, in some cases, been a direct cause of scoliosis, but only in six particular cases has pleuritic exudate been the exclusive cause. But this, like other similar special causes, as cramp and neuralgia (M. Eulenburg), can only be considered as an incidental coincidence.

*Paralysis of the Muscles of Inspiration.* — Stromeyer considers that the majority of cases of scoliosis arise from paralysis in certain of the muscles of inspiration. He sought to apply the theory of Charles Bell in regard to the double nerve supply for certain of the refractory muscles as the origin of scoliosis. The levator anguli scapulæ, sterno-cleido-mastoid, and rhomboideus receive branches both from the spinal nerves and from the spinal accessory. The function of the latter may be interrupted without interfering with the former. After the division of the spinal nerves going to the above-named muscles, according to Bell's experiments, the involuntary breathing would cease, but not the voluntary.

Stromeyer claims the same mode of action for the thoracic nerve upon the serratus magnus muscle, as well as the spinal accessory nerve upon the muscles already named. On account of paralysis of the thoracic nerve, the involuntary activity of the serratus magnus muscle ceases, while the voluntary activity re mains. Because of this disturbance, there is a different development on the opposite side of the thorax, and as a result scoliosis sets in. The author claims that this most generally takes place upon the left side. This theory has won recognition from numerous scientists. Rokitansky speaks of it in his "Pathological Anatomy;" but H. Sätherberg says that the reception of Stromeyer's theory would unconditionally lead us to an extremely strange conclusion in reference to the nature of paralysis in general. The S-formed scoliosis rarely appears before the seventh year, and its occurrence is extremely rare among boys. If we accept Stromeyer's theory, then we must also take the position that paralysis could rarely affect the muscles of respiration before the seventh year, or those of more advanced years, and that boys are much less subject to it than girls. I see no ground, however, for taking such a position in regard to the nature of paralysis.

M. Eulenburg remarks that "it is singular that the paralysis of the serratus magnus muscle should occur so frequently upon the left side. The cause which this theory assigns for scoliosis can command no greater significance than that which should be given to any predisposing cause, as, for example, pleuritic exudate."

*Inflammation of the Muscles.* — If the muscles are seized upon one side by a painful affection (rheumatism), causing the patient, for relief of the pain, to seek to maintain the muscles in as active a condition as possible, then, in consequence of the activity of the antagonistic muscles, there will follow a curve of the spinal column, with the concavity toward the sound side. Scoliosis from this cause could rarely occur. Although I have had under my care a large number of cases of inflammation of the muscles of the back, there have been among them but two cases of scoliosis which have arisen from this cause.

*Contraction of the Muscles.* — Two forms of pathological contraction of the muscles have been given by different authors. Professor Blasius gives a prominent pathological contraction of the muscles of one side (still retaining, however, the ability to relax) as the primary cause for scoliosis through an abnormal activity of the nervous system.

The other form — a pathological contraction of a part of the muscles of one side — is given by Guerin. Neumann also gives contraction of the muscles as a cause for scoliosis. That a certain form of rheumatic inflammation may occasionally cause a permanent contraction cannot be denied. Torticollis frequently occurs as the result of such a cause; but to take the position that this is a general cause is opposed to both experience and theory. The definite form under which the majority of cases of scoliosis fall, witnesses clearly against the admission that a pathological retraction in certain muscles is a general cause for scoliosis, for no good reason can be given why this pathological process should so constantly arise in the same place.

Another striking argument against this opinion is, that if the theory were correct, subcutaneous operations should be followed by favorable results. Dieffenbach, who was specially noted as a defender of

subcutaneous myotomy and tenotomy, says that this operation is contraindicated in scoliosis. Malgaine, Büring, and M. Eulenburg say that subcutaneous operations in scoliosis are not followed by favorable results.

(To be continued.)

## OVARIAN GRAFTING FOR PREVENTING DISTURBANCES FROM POST-OPERATIVE MENOPAUSE.

BY J. H. KELLOGG, M. D.

DR. CHROBAK, professor of obstetrics at Vienna, with Mainzer, Landau, Mond, and others, have succeeded in preventing the disturbances due to the menopause occurring after removal of the ovaries, by the administration of ovarian juice; but the good effects obtained ceased as soon as the remedy was no longer administered. Chrobak recommends that a portion of the ovaries should be left, when possible, or that the ovaries of other animals should be implanted.

Chrobak has frequently left portions of ovaries, but has not undertaken the experiment of implantation of the ovarian tissue of other animals in women, although experiments made by Dr. Knauer in animals have shown very good results, the implanted ovaries becoming provided with numerous blood-vessels, and apparently carrying on their function in a normal way, which goes to show that the sexual glands are useful in the body not simply with reference to reproduction, but as a means of maintaining a state of normal equilibrium in the various vital functions, and in some manner regulating tissue changes through their secretion.

In operating upon a patient July 22, 1896, for removal of diseased appendages, I made an ovarian graft as follows: I first prepared a place for the graft by separating the skin and subcutaneous tissues from the sheath of the rectus muscle extending to the left of the incision a couple of inches. As soon as the appendage was ligated, I cut off about one third of the ovary, making the division transversely, and leaving half an inch of the ovarian ligament attached to the excised portion. This I carefully placed at the bottom of the pocket made as above described, and then proceeded to close up the wound in the usual manner, taking care to keep the graft in position. No inconvenience has thus far arisen from the implantation of the ovarian tissue, but sufficient time has not yet elapsed to determine what will be the effect in diminishing the nervous disturbances which are sometimes so distressingly intense as the result of the changes set up by the removal of the appendages.

## ONE MONTH'S MEDICAL WORK OF THE COLORADO SANITARIUM.

BY W. H. RILEY, M. D.,
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THE Colorado Sanitarium began its work as an institution for the treatment of all forms of chronic disorders, July 1, 1896. From July 1 to August 1, 1896, fifty-nine persons were received and treated in the institution. This does not include a large number of transients, who live outside and come to the institution for treatment, daily.

These fifty-nine persons are from the States of Colorado, Ohio, Michigan, New York, Missouri, Kansas, Pennsylvania, Minnesota, Wyoming, Iowa, Nebraska, Illinois, District of Columbia, Wisconsin, Nova Scotia, and Ontario, Canada.

Without giving a detailed diagnosis of each case, the disorders that have received medical treatment in the institution come under the following heads:—

1. Diseases of the lungs, nineteen cases. All these cases contracted the disease outside of the State of Colorado, and came to the sanitarium to be treated for pulmonary trouble, especially. The bacilli of tuberculosis were found in fourteen out of the nineteen cases. Besides the bacilli of tuberculosis, in many of the fourteen cases were found cocci of different forms, showing that there was a mixed infection. Elastic tissue, pus, and blood were found in several cases.

2. Diseases of the female genito-urinary organs, sixteen cases.

3. Naso-pharyngeal catarrh, seventeen cases.

4. Diseases of the digestive system, sixteen cases.

5. Catarrh of the middle ear, with deafness, two cases.

6. Nerve exhaustion, four cases.

7. Chronic malaria, with plasmodia of malaria found in the blood, two cases.

8. Organic disease of the heart, one case.

9. Right hemiplegia, with paraphasia, one case.

10. Hay fever, one case.

11. Abscess of the breast, one case.

12. Herpes zoster, one case.

13. Convulsive tic, on right side of face, one case.

14. Spastic paraplegia, one case.

During the month of July the following work has been carried on in the laboratory of hygiene connected with the Colorado Sanitarium: —

1. *Examination of the Urine.* — Chemical and microscopical examination of the urine has been made of sixty-five different specimens. A twenty-four hours' specimen is required of each person who enters the institution as a regular patient. Albumin was found in seven cases; pus was present in six cases; four cases showed granular casts; two of the four cases in which casts were found had tuberculosis of the lungs.

2. *Examination of the Sputum.* — There have been thirty-three specimens of sputum examined, from twenty-one cases. Fourteen of the cases examined showed the presence of the tubercle bacilli; and elastic tissue was found in eight of them.

All the lung patients are required to use private cuspidors, and no one is allowed to spit on the grounds or the floor. All the sputum of each case is collected in these individual cuspidors, which are gathered up at least once each day, the sputum being burned in the furnace. The strictest measures are carried out in the institution to prevent infection, and no one in the building or upon the sanitarium premises is in the slightest danger of contracting the disease from another patient.

The sputum of each case is examined at least once a week, for the purpose of determining if there is any change in the amount of expectoration.

3. *Examination of the Blood.* — Microscopical examination of the blood has been made in forty-seven cases, having reference to the percentage of hemoglobin, the size and shape of the red corpuscles, and also to the number of white blood cells.

The amount of hemoglobin was one hundred per cent. in five cases; between ninety-three and one hundred per cent. in eight cases; between eighty-five and ninety-eight per cent. in eight cases; between seventy-nine and eighty-seven per cent. in seven cases; between seventy-one and seventy-nine per cent. in eleven cases; between sixty-five and seventy-one per cent. in one case; and between fifty and sixty-five per cent. in two cases.

In twenty-seven cases the white blood corpuscles were normal in number, or 4,500,000 to 5,000,000 per cu. m.m.; in eleven cases, they were decreased in number; and in nine cases they were above the normal number.

*Methods of Treatment.* — The remedies used in the institution for the treatment of various diseases consist in the application of hydropathy in its different forms, based upon the results obtained by scientific investigation of the action on the body of different forms of baths. All forms of electricity are used, and such a current is selected as seems best adapted to the case in hand. "Rest-cure," massage, manual Swedish movements, graduated exercises, including mountain climbing, are among the therapeutic remedies used.

Regulation of the diet and careful attention to the nutrition of the patient form important adjuncts in the treatment of every case that enters the institution.

Special rooms are arranged for the continual inhalation of medicated air in cases of tubercular and other forms of lung trouble when indicated. The intelligent use of the above remedies, in connection with the climatic advantages of an elevation of about five thousand feet, provides the very best opportunity for the treatment of that large and apparently increasing class of chronic invalids suffering from tuberculosis of the lungs and other pulmonary troubles.

With every sunset for three hundred and sixty-five days in the year, and that year after year, no less than four hundred fresh graves are added to the large army of the sleeping dead as the result of the ravages of that dread disease, pulmonary consumption. The Colorado Sanitarium reaches out a helping hand to this unfortunate class of invalids, and has already brought relief to a large number whose lives were endangered by the insidious development of this malady.

# TRANSLATIONS AND ABSTRACTS

[THE articles in this department are prepared expressly for this journal.]

## HOT AND COLD APPLICATIONS IN THE TREATMENT OF THE EYE.

IN an article on this subject in the August number of the *University Medical Magazine*, Dr. William C. Posey, of Philadelphia, remarks that it is evident that heat and cold exert a profound influence upon the temperature of the human eye, and that the intensity of their effect depends largely upon the length of time they are applied. If, therefore, the treatment of ocular diseases was simply a question of influencing the temperature, the indications for the employment of these agents would be quite simple; but in addition to the action which they have upon heat control, that which they exert upon the circulation of the eye, independent of its influence over the regulation of the amount of heat in a part, is of no less significance from a clinical standpoint.

In inflammatory conditions, cold limits the exudation and checks the secretion by constricting the capillaries; while heat aids in the healthful repair of tissues by promoting absorption of the exudation, and by carrying the proper nourishment to the part. Again, in the early stages of inflammation, cold relieves pain both by preventing the flow of blood to the part by contracting the blood-vessels, and by limiting the amount of exudation. In the latter stages, heat relieves pain by causing absorption of the exudation, and lessening the tension of the inflamed area. Moreover, heat greatly augments the diffusibility of liquids into the eye, for Bellarminoff and Dolganoff have shown that the rapidity and the amount in which drugs are absorbed after the application of the hot compress are due to a change which is wrought in the corneal epithelium.

Finally, both agents have a germicidal action. It has been found that a 1-10,000 hot solution of bichlorid of mercury is more efficacious in preventing pus-formation than a cold one of 1-2000. Water itself at a temperature of from 230 to 284° F. kills many bacteria, while cold, even of the degree at which it may be applied to the eye, will prevent the development of germs.

Heat and cold may be applied in either a moist or a dry form. A greater action is usually derived from the moist compress, whether it is hot or cold, for Jaennec, says the author, has proved that therapeutically moist heat is not only more penetrating than dry heat, but gives a greater variation in the degree of heat. Giesse has also shown that the cold compress will lower the temperature much more rapidly than bladders filled with ice; moist applications also possess the greater advantage of washing away all secretions from the conjunctival sac.

In regard to the toilet of the eye, lukewarm applications will usually be found to give the greatest comfort. A little boric acid or sodium chlorid added to the water will make the application even more grateful. In regard to the practise of opening the eyes in a basin of water after the head has been immersed in it, Dr. Posey says that we are not fishes; our eyes are not adapted for such a procedure, and we should rest satisfied with the glass dropper or the eye-cup.

In hyperemia of the conjunctiva, induced by ametropia or by the presence of a foreign body, cold is a simple but effective means of restoring the membrane to its healthy condition. In these cases, the douche or the compress may be applied over the closed lids with the greatest advantage for fifteen minutes at a time. The water employed should not be too cold, or excessive reaction may follow its use.

In the severer forms of conjunctivitis, when there is a purulent inflammation or an exudate, ice is the sovereign remedy; and there is but one way to apply it — by the continued use of the ice compress. Disastrous results need not be feared, says Dr. Posey, from its prolonged application, for of all the remedies used to combat this type of disease in the early stages, this is undoubtedly the best. At the outset of the disease the board-like swelling of the lids is doubtless one of the chief causes in elevating the temperature; and, as the swelling and induration prevent the cold from gaining access to the eye, it is necessary that the treatment should be energetic and prolonged. The application of compresses, therefore, should be maintained night and day in such cases, and should only be desisted from when a

corneal ulcer threatens or the secretion becomes excessive. When either of these two contingencies arises, the ice compress should be replaced at once by the hot application, and this should be persisted in for fifteen minutes every two or three hours. The hot water will relieve the stagnant condition of the corneal circulation that has been induced by the intense chemosis of the bulbar conjunctiva, and thus favor the repair of the cornea.

In treating disease of the cornea, hot compresses are always indicated, never cold. The cornea is normally a non-vascular structure, and is dependent for its nourishment upon the tissues surrounding it; and if these are diseased, a stasis in the nutritive supply of the membrane occurs, and ulceration ensues. The chief indication, therefore, in treating diseases of the cornea is to prevent this stasis. This, he says, is admirably accomplished by means of moist heat, provided it is properly applied. One of the most frequent forms of corneal ulceration is phlyctenular keratitis. This disease occurs usually in children of a scrofulous diathesis, and there is no sadder sight nor more striking example of the injury wrought by the ignorant application of remedies by the laity than is seen in this disorder. Dr. Posey states that it is frequent in the ophthalmic clinics to hear the mothers of such children recite with pride a list of all kinds of harmful and disgusting substances with which they have poulticed the eye,—tea leaves, rotten apples, raw oysters, bread and milk, and potatoes, are the favorite articles,—and the persistency and ignorance with which they are employed are most distressing to the intelligent practitioner. Dr. Posey says emphatically that poultices should never be employed in diseases of the globe itself, although they are at times of service in inflammations of the *annexa*.

Instead of the use of the poultice, moist heat is best applied in diseases of the cornea by the ordinary compress, which should be kept applied for ten or fifteen minutes at a time four or five times daily.

Hot compresses will be found to be an excellent stimulant to sluggish ulcers, and will also hasten the absorption of nebulæ. A few drops of scalding water, applied directly to a myotic ulcer, will exert a powerful antiseptic action upon it. In interstitial inflammation of the cornea also, when the whole uveal tract is inflamed, and the ciliary body especially is hyperemic, much relief will be afforded by the prolonged and unvarying use of hot fomentations, for from three to eight hours daily at periods of every two hours. Indeed, where posterior synechia has not yielded to atropine, and where there is a rise in the intraocular tension, the mydriatic will have to be withdrawn, and only hot applications and the administration of an alterative internally to lessen the inflammatory condition can be used.

In the early stages of granular conjunctivitis, hot water is frequently badly borne; as soon as the vascular condition of the cornea manifests itself, however, the use of hot compresses should be inaugurated, for the inflammatory reaction which they occasion is frequently sufficient to cause the disappearance of the pannus.

One of the most distressing symptoms of phlyctenular disease, continues Dr. Posey, is the photophobia, with spasm of the orbicularis, which it occasions; great difficulty is often encountered in applying the proper remedies to the eyes until these have been made to subside. In urgent cases the eyes may sometimes be opened by immersing the entire head of the child in a bucket of cold water, the sense of suffocation and shock causing it to open its lids in a reflex way as it gasps for breath. An equally effective and less heroic measure consists in permitting a few drops of ice water to trickle between the lids, which are then gently coaxed apart by the surgeon's fingers.

It is a matter of experience that dry heat is more efficacious than moist heat in soothing the pain of neuralgia. It will also be found that in cases of iritis, when there is little or no secretion except the tears of reflex irritation, the dry compress is the most efficacious, while in iritis secondary to inflammations of the cornea the moist compress gives the best results.

In addition to its action upon the blood-vessels of the iris and ciliary body, the hot compress is invaluable on account of its increasing the absorption of drugs which are used for the purpose of dilating the pupil. It will frequently be found that mydriatics exert but little influence over the pupil in cases of iritis, even when the synechiæ are not very tenacious. Leeching and cocaine will partly overcome this, but there is nothing so effi-

cacious as bathing the eye with water as hot as can be borne about ten minutes before the instillation of the mydriatic.

After penetrating wounds of the eye, particularly when the iris and the lens have been injured, and if there is the complication of plastic iris and traumatic cataract, in addition to the other treatment, the author states that the continuous use of the ice compress will be found to be a potent agent in combating inflammatory reaction, and in preventing the invasion of noxious germs by reducing the temperature of the parts. In suppurative panophthalmitis, he says, hot applications are grateful from the very onset, and may be kept up almost continuously. The pain arising from muscular asthenopia is also often allayed and the symptoms at times are made to disappear by the use of hot compresses, for the heat actually increases the contractile power of the weak muscles. But if there is any tendency to disease of the deeper structures of the eye, such as the retina or the optic disk, it is well to avoid the use of hot applications, as they may cause further mischief by increasing congestion in these delicate membranes — *N. Y. Medical Journal.*

**Pleural Effusion.**— Baccelli (*Il. Policlinico*, June 14, 1896) calls attention to a sign which is an aid in the diagnosis of fluids in the pleura. The patient being made to utter the word "trentatre" (Italian 33) in a whisper, if the fluid is very thin, every letter of the word will be heard; but in proportion as the fluid is thicker, the letters are gradually lost, up to final disappearance of all conduction. The first letter to fail is *r*, then *t*, then *n*, and finally the vowel sounds. In order to hear this "Baccelli's phenomenon," direct auscultation should be used in the antero-lateral and inferior regions of the thorax, and without the stethoscope.

**A Reagent for Alcohol.**— Even minimum traces of alcohol in aqueous solutions may be detected by molybdic acid (*Chemical News*). The sensitiveness of this test extends, for ethyl alcohol, to 0.02 per cent.; and for methyl alcohol, to 0.2 per cent. Molybdic acid is dissolved in concentrated sulphuric acid, and the solution thus obtained is stratified in a test-glass at about sixty degrees below the liquid under examination. At the surface of contact of the two liquids there appears a distinct blue ring, the intensity of the color varying with the amount of alcohol present. On shaking, the blue zone disappears, but reappears on the addition of more molybdic acid. The reaction is not specific for alcohol.

**Tobacco, Tea, and Champagne in England.**— The great increase in the consumption of tobacco (*Therapeutic Gazette*), especially among growing lads, can not fail to have its due effect on the development of both mind and body. The net revenue yielded last year by the tax on tobacco amounted to $52,500,000, this being more than $1,500,000 in excess of the sum afforded from the same source during the preceding year. This excess is attributed by the chancellor of the exchequer mainly to the increase in the consumption of cigarettes. Another point revealed by the budget is the increase in the consumption of tea, ten million more pounds having been consumed during the past than in the previous year. That we are not becoming a more temperate nation is shown by the fact that in 1895 no less than 1,200,000 extra bottles of champagne were consumed.

**The Fly as a Germ Carrier.**— In 1866, Hoffman demonstrated the presence of tubercle bacilli in the bodies of flies captured in a room occupied by a consumptive. The droppings of the flies were full of bacilli, which were shown by experiment to be fully virulent.

Six years later Mr. A. Coppen Jones, of Switzerland, proved by means of chromogenic bacteria that infection can be, and actually is, carried, not only in the bodies of flies, but also by their feet. In one experiment, cultures of the bacilli prodigiosus were mixed with tuberculous sputum. Flies which had been in contact with this mixture were permitted to walk across the surface of sterilized potatoes. In forty-eight hours numerous colonies of the bacillus prodigiosus were visible.

From these results we may reasonably conclude that flies are a constant source of infection.

**Creosote in Gonorrhea.**— Asmus (*Meditz. Obozr.*, 1896, No. 10) reports fifty-eight male cases of acute gonorrhea successfully treated with injections of a 2-to-10 per thousand emulsion of creosote. The discharge quickly decreased, became mucoid, and then ceased altogether. The patients recovered more rapidly than under the ordinary methods of treatment; complications developed but rarely, and no relapses occurred. In addition, creosote seemed to exercise an anesthetic action on the urethral mucous membrane.

**Massage in Chronic Heart-Disease.**— J. Zabludowski (*Berlin Kliniche Wochenschrift*, 1896, xxxiii, pp. 435–437) advises the employment of massage in cases of chronic heart-disease where rest is indicated. When properly applied, the pulse-rate is diminished, the quality improves, the sleeplessness is relieved, and a decided change for the better is noticed in a few days.

It is essential that the patient lie in a convenient position, so that the part to be acted upon shall be entirely lax. The movements must be energetic, but not rough, and last ten to fifteen minutes; the time of application should be one to two hours after the first meal. All kinds of massage may be used with the exception of tapotement. Massage has also been found serviceable in the treatment of neurosis, sclerosis of the coronary arteries, hypertrophic conditions resulting from high living, and heart weakness following la grippe. The time of treatment should extend over a period of four to six weeks of daily treatment.

**The Treatment of Epistaxis.**— Gillette says (*British Medical Journal*) that peroxid of hydrogen injected into the nasal cavity will stop hemorrhage from the nose. Use the remedy in full strength, and the result will be immediate. When operating in the nasal cavity, if bleeding hinders the work, inject peroxid of hydrogen, and ask the patient to blow the nose, and the field will be left clear again.

**Heredity and Crime.**— The following, taken from the *Medical Press*, compiled by Professor Pellmann, of the University of Bonn, relates the career of a notorious drunkard, who was born in 1740 and died in 1800. Her descendants numbered 834, of whom 709 have been traced from their youth. Of these, seven were convicted of murder, seventy-six of other crimes, 142 were professional beggars, sixty-four lived on charity; and 181 women of the family led disreputable lives. The family cost the German government for maintenance and costs in the courts, almshouses, and prisons, no less a sum than $1,250,000; in other words, just a fraction under $1500 each. It would probably be difficult to find a more remarkable example than this of the evil effects of the transmission of hereditary defects.

**Thyroid Extract in Gynecology.**— Dr. Hortoghe, of Antwerp, who claims to have obtained excellent results from the use of thyroid products in gynecology, summarizes his observations as follows: —

1. Myxedematous hemorrhages are directly amenable to this treatment.

2. The same is true of hemorrhages due to endometritis and oophoritis, even of old standing.

3. Menorrhagia of whatever origin, is favorably influenced by thyroidin. Cancerous hemorrhages, though it may appear to be incredible, cease promptly under three or four days' thyroid treatment. Other symptoms, such as pain, swelling, and congestion, are also markedly relieved by this treatment.

4. In women who are prone to miscarriage on account of the fecundated ovule being carried away by a too copious menstrual flow, the administration of thyroid juice diminishes the molimen and uterine congestion. In one case described in detail by the author, a woman who had been sterile for seven years was enabled by the inhibitory action of thyroidin to conceive and give birth to a child at term.

5. Thyroidin is useful in cases of uterine myoma, prolapse of the uterus, retroflexion with hemorrhage and, in general, in all cases in which it is of importance to reduce the size, congestion, and sensitiveness of the uterus.

6. Lastly, on account of the special action of the thyroidin on the mammary glands, this substance should be given to wet-nurses with a defective secretion of milk.

**Gastric Crises in Diabetes Mellitus.**— Grube (*Munch. Med. Woch.*) gives the name of "gastric crises" to the attacks which occur not infrequently in diabetes, coming on suddenly with vomiting, colicky pains, dry and coated tongue, cramp in the legs, and slight fever. Diarrhea sometimes occurs. The attacks last from several hours to several days. Grube thinks the attacks represent a form of diabetic intoxication, in which the vagi are irritated by toxins circulating in the blood. Under proper treatment, recovery is the rule. The most important thing is to cause copious stools by means of enemata. Hot applications to the abdomen are also useful. The vomitus consists generally of the undigested meal previously taken.

**Heat Regulation.**— The following interesting facts have been developed by a series of experiments by Dr. Pembrey (*Journal of Physiology*, XVIII, 363): —

"In newly born animals, the power of heat regulation varies according to the development of the animal at birth. Young animals such as mice, rats, and pigeons, which are born blind, naked, and helpless, respond to changes of external temperature in a way somewhat similar to that seen in cold-blooded animals; the variations in the respiratory exchange and the temperature of the animals are in the same direction as the changes of external temperature. These young animals cannot regulate their temperature. On the other hand, such young animals as guinea-pigs and chickens, which are born in a condition of high development and with protective coverings, are able even at birth to maintain a constant temperature, provided that the changes in external temperature are not excessive.

"It is important to consider here the part played by the loss of heat; in small naked animals, like young mice, the cutaneous surface in relation to the mass of the body is very large, and thus more rapid cooling will take place. But that this is only a secondary factor to the development of the power of regulation is shown by the fact that when the fur is quite long, an exposure to cold does not increase and maintain the increase in the output of carbonic acid so well as in the adult, and after a time the temperature of the young animal falls. Moreover, a pigeon fifteen days old can maintain its temperature fairly well, although three quarters of its body is naked.

"The activity of the animal has also to be considered. In adult warm-blooded animals and in newly born animals like the guinea-pig and chick, a low temperature increases the activity of the animal. . . . In warm surroundings, on the other hand, the animal is quiet and often goes to sleep; if the temperature is very high, it lies extended to expose as large a surface as possible, and sweats. In young animals, which only imperfectly regulate their temperature, muscular activity is often most marked and maintained at the higher temperatures. The first effect of a fall is often, it is true, to make the animal active, but its movements soon become feeble, and as regards their purpose, are of a similar nature to shivering.

"The development of the power of heat-regulation proceeds simultaneously with the development of the nervous and muscular systems. At the same time the relation of the cutaneous surface to the mass of the young animal and the absence or presence of protective coverings are factors, but only of secondary import."

**Tuberculous Cows' Milk.**— After the most careful experiments, Drs. Ernst and Peters arrive at the following conclusions concerning the infectiousness of milk: —

"First and emphatically, that the milk from cows affected with tuberculosis in any part of the body may contain the virus of the disease.

"That the virus is present, whether there is disease of the udder or not.

"That there is no ground for the assertion that there must be a lesion of the udder before the milk can contain the infection of tuberculosis.

"That, on the contrary, the bacilli of tuberculosis are present, but with no discoverable udder lesions."—*Journal of the American Medical Association.*

**Therapeutic Effects of the "X" Ray.** — Experiments have shown that "X" rays have no destructive effects upon microbes. But Nicola Tesla says their effect, when directed upon the human brain, is soothing and gently stimulating. This influence may be wholly psychic.

**Toxic Germs of Alcoholic Drinks.** — Daremberg (*Arch. Med. Experimentale*, November, 1895) has recently completed a series of experiments for the purpose of determining the toxicity of various alcoholic drinks by the injection of rabbits. Contrary to the popular notion, it is found that wine drinks are more poisonous than drinks made from purified alcohol, and that wines are more poisonous than solutions of pure alcohol of the same strength.

**Oysters and Typhoid Fever.** — M. Chantemesse (*La Presse Medicale*) recently communicated to the French Academy of Medicine the results of an investigation which he believes establishes, beyond room for question, the fact that typhoid fever may be communicated by oysters. The case which gave rise to the investigation was as follows: —

In a small community where typhoid fever had not appeared for a period of one year, a family was suddenly attacked with various disturbances, after eating oysters from Cette. Some of the members of this family suffered only from gastralgia, others from more severe gastric disturbance; while others had a regular attack of typhoid fever.

A bacteriological examination of the oysters, made by M. Chantemesse, revealed the presence of both the coli bacillus and the typhoid bacillus.

After having been allowed to remain some days in a mixture of sea-water and fresh water, the oyster still contained a quantity of the same virulent bacilli, and Chantemesse concludes from this observation that the oysters furnished for consumption in the markets of Paris are dangerous. The author states that "the contamination of oysters occurs in oyster beds at the mouths of rivers; the more heavily the rivers are charged with organic matter, the fatter the oysters become, and the more dangerous."

American physicians have called attention to analogous facts, several instances of a like character having occurred in this country.

The work of M. Chantemesse has been placed in the hands of a special commission composed of MM. Gautier, Cornil, and Laboulbène, eminent scientific men, who will give the subject the serious attention which it deserves.

**Thyroid Extract in Goiter.** — A German physician has recently reported excellent success in the treatment of hypertrophic goiter by thyroid extract. The dose for an adult is two tablets per day; for a child, one tablet. The treatment proved most advantageous in young persons.

**The Oxidation Ferment.** — M. Carnot recently reported to the Biological Society of Paris (*Medical Week*, June 5, 1896) the discovery, in the saliva, of a ferment which gives rise to oxidation. This ferment was found in the secretions of all the salivary glands, in the buccal mucus, in the nasal mucus, in the tears, and in the product of some other glands, but was not found in the urine, the bile, or the intestinal juices.

**Cinnamon for Dysentery.** — A surgeon in the British army in India writes to the London *Lancet* that he has for several years employed with success in the treatment of dysentery a very simple remedy, consisting of one dram of cinnamon bark reduced to a fine powder and made into a ball with a few drops of water. This may be taken every morning and evening. He learned of the remedy from a Persian medical work, it being very popular in Persia. Its virtues may be due to the antiseptic or germicidal properties of oil of cinnamon.

**Infectious Character of the Feces of Tuberculous Cattle.** — Scientific research is constantly bringing to light new methods by which tubercle bacilli are communicated to human beings. The *Bulletin Medicale* recently published a report of a series of experiments conducted for the purpose of determining whether these bacilli are to be found alive in the excreta of cattle. A young bullock was fed a meal consisting of bread and a portion of a tuberculous lung. During the three days following, portions of fecal matter were collected and investigated, both by the injection of animals and microscopical examination. Bacilli were constantly found in the feces, and out of fifteen rabbits inoculated, twelve became tuberculous, showing that the fecal matters of tuberculous cattle are as infectious in character as the sputum of persons suffering from this disease.

# BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE AND BACTERIOLOGICAL REVIEW, from original sources.]

**Rapid Isolation of Bacillus Coli Communis.**— Abba (*Centr. f. Bakt., Parasitenk, u. Infectionskrankh.*, Bd. xix, 1896, p. 13) gives a new method for the "rapid and certain isolation of bacillus coli communis from water." He prepares the following culture medium: Lactose, 20 g.; dry peptone, 100 g.; sodium chlorid, 50 g.; and water, 1 liter. This may be solidified by the addition of gelatin. Into a liter of suspected water is placed 100 c. cm. of the previously sterilized culture medium; to this is added 0.5 c. cm. of a one per cent. alcoholic solution of phenol-phthalim, and afterward a cold saturated solution of sodium carbonate (usually 2 to 3 c. cm. suffice) until the water becomes of a permanently pink color. This water is placed in five or six Erlenmeyer's flasks, and incubated at 37° C. At the same time an agar plate is poured, and is placed in the incubator along with the Erlenmeyer's flasks. If bacillus coli were present in the water, after twelve, sixteen, or twenty-four hours one or several or all of the flasks will show complete decolorization of the contents. The agar plate is inoculated from the surface of one of the colorless fluids; this is again incubated, and in from eight to twelve hours or less a number of colonies will be visible on the surface of the agar. These colonies are examined under the microscope, and cultures made from the ones which most resemble those of the bacillus coli. Under these conditions the bacillus coli rapidly gains the upper hand over most of the other micro-organisms present in the water. The colonies on the agar plates are usually composed of bacillus coli alone, and the first examination leads to their detection, if present.

**Excretion of Micro-organisms.**— Biedl and R. Kraus (*Centralbl. f. inn. Med.*, July 18, 1896) have previously shown that micro-organisms present in the blood are excreted by normal kidneys, the urine being free from albumin or blood. These investigators now record their experiments on the excretion of micro-organisms by the glandular organs. By injecting cultures of staphylococcus into the blood, they have investigated the function of the liver and submaxillary gland in this respect. They found negative results in two of the first four experiments where the gall-bladder was opened immediately after death, the usual precautions being used. In another series of experiments the bile was inoculated directly into nutrient media, a canula having been placed in the bile passages. In case of the submaxillary gland a canula was placed in the duct, and the same method followed. In all these cases the staphylococcus was obtained from the bile, but the results were negative in all cases where the submaxillary secretion was investigated. The micro-organisms were shown to be continuously excreted in the bile during one and a half to two hours, while the experiment lasted. From these experiments these investigators conclude that as in the case of the kidneys the excretion of micro-organisms is a normal function of the liver.

**New Method of Diagnosing Typhoid Fever with Serum from Patient.**— Recent investigations by Pfeiffer, Koll, and Gruber have shown (*Bulletin Medicale*, June 28) that the serum of persons convalescing from typhoid fever, the same as the serum of animals immunized against typhoid infection, will produce a distinct and specific reaction when added to a culture of Eberth's bacillus *in vitro*. They found the same phenomena with the cholera spirillum and Escherisch's bacillus. The process is so clearly defined that it promptly differentiates the disease, while it is so simple that it requires nothing but a tube culture of Eberth's bacillus (which keeps for weeks) and a drop of blood to complete it. If a few drops of immunized serum be added to a culture of the coli bacillus, a noticeable cloudiness is produced, with decided motility of the microbes. The effect is entirely different if they are added to a tube culture of Eberth's bacillus. There is no cloudiness, but the reverse; the microbes cluster in masses, forming agglomerations and a precipitate at the bottom of the tube, with limpidity instead of cloudiness. This agglutination is the point in differentiating, and the higher the serum is immunized, the more

rapid the effect, sometimes occurring as rapidly as a chemic process.

Widal announces that he has been testing the serum from patients in various stages of the disease, and has found the reaction unmistakable in each. He draws the blood from the vein in the bend of the elbow, with a syringe, after antiseptic precautions, or from the hand of the patient, hanging over the edge of the bed, after slightly massaging the finger from the root to the point, when a prick with the lancet will draw enough blood (½ to 2 c.c.), which should be caught in a thimble or test-tube first passed through a flame. After corking, and waiting a few minutes for the serum to separate, add one drop of the serum to ten drops bouillon culture of Eberth's bacillus, and in a very short time the agglomeration commences, if it is a case of typhoid. Between the characteristic agglutinations a few scattered and motile microbes are still to be seen, growing less in number until, in a few hours, they have all been absorbed into the clustered masses. The drop of blood can be drawn directly into the culture, but no time is gained, as the serum has still to separate. Widal also made the test with serum from normal persons and from numerous patients suffering from different diseases, as well as from persons who had recovered from typhoid fever from one to fourteen years previously. In each of these cases there was none of the specific typhoid reaction, the agglomeration, but the Eberth's bacillus kept on the even tenor of its way, isolated and motile.

**Bacteriology.**— Professor Savtchenke (*La Press Medicale*) has recently described a new microbe which produces a disease similar to that produced by the fungus of ordinary actinomycosis.

**Streptococcus of Scarlet Fever.**— M. Ad. d' Espine (*New Eng. Med. Month.*, July, 1896) has isolated from the blood and tonsillar exudation of scarlet fever cases a streptococcus which rapidly coagulates milk, with the formation of whey and curd. In this respect it differs from the common streptococci, which, though they curdle milk, form a compact clot without producing whey. The scarlatina streptococcus is much smaller than the ordinary cocci, and differs in shape, being round, while the ordinary coccus is lenticular.

**Are Microbes Necessary to Human Life?** — A correspondent of the *Polyclinic* (Philadelphia) writes as follows in opposition to the popular theory that microbes are necessary to physiologic digestion: —

"As far as the animal body is concerned, the interesting experiments of Nuttall and Thierfelder indicate its independence of bacterial life, for they have shown that in the absence of all microorganisms an animal may live and thrive.

"Their experiments were as follows: A young guinea-pig was secured by Cæsarian section, under strict aseptic and antiseptic precautions, and immediately transferred to an apparatus consisting of a bell-jar placed over a small vessel containing water covered with a layer of oil. Over this vessel was laid a piece of wire netting, upon which the animal could move about. In the sides of the bell-jar were two apertures — in one a rubber glove, in the other a suction tube communicating with a bottle of sterilized cow's milk. The glove was connected with a rubber bag containing wads of cotton, which by manipulation of the glove could be placed on the wire screen, and after use could be dropped into the water beneath. The coating of oil prevented the evaporation of the water. From time to time the apparatus was ventilated with sterilized air.

"For a time the animal lay on its side, but soon rose on its legs, and as it became dry, grew active and lively. It received milk for the first time twelve hours after birth; thereafter, every hour, day and night. After eight days it was removed from the apparatus, killed, and opened under antiseptic precautions. A microscopic examination of the intestinal contents, in stained and unstained preparations, revealed a total absence of bacteria. Tubes inoculated with the contents and kept under both aërobic and anaërobic conditions remained perfectly sterile; not a single colony developed.

"From these results the experimenters conclude that the presence of bacteria in the intestinal canal is not necessary for guinea-pigs, nor for other animals or for man, at least not as long as the food is purely animal."

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## COW'S MILK A CAUSE OF DISEASE.

IT is a curious fact that the use of sweet cow's milk is chiefly confined to English-speaking nations, and many travelers have made the observation that tuberculosis, that great plague of civilization, which is responsible for from one seventh to one fourth of all the deaths which occur in England, America, Canada, and other English-speaking countries, is comparatively rare among nations who do not use cow's milk. The cow, of all domestic animals, is most subject to tuberculosis, and by its association with man there is abundant opportunity for the communication of the disease to the cow from human beings affected by it. The contagious character of consumption is now fully established, together with the fact that the germs which produce it are often found in cow's milk, and even in butter and cheese, existing in the latter for weeks without losing their activity.

The people of semi-civilized and uncivilized countries, and a few among civilized nations seem to have an idea of the deleterious qualities of cow's milk in its natural state; accordingly, we find that in many countries the milk of goats, sheep, or mares is substituted for that of cows, and with advantage, for the reason that these animals are only slightly subject to tuberculosis, and produce a milk which more closely resembles human milk than does cow's milk. The prevailing custom in the use of milk, however, in nearly all except English-speaking countries, is to avoid taking it in its natural, or sweet state. The German housewife never thinks of placing milk upon the table until it has been naturally fermented, and converted into a soft curd. Taken in this form, milk does not form hard curds in the stomach. The same is true of most of the countries of continental Europe. The same custom prevails in Scandinavian countries, also in Italy and Spain, Turkey, Hungary, and in all Asiatic countries. The Kaffirs of South Africa sour the milk before using it, placing it overnight in a gourd kept for the purpose, and which is never washed. The same custom prevails among the natives of the Congo and other portions of Africa where cow's milk is used. The natives of Iceland during their short summer milk their flocks of sheep, and pour the milk into a large hogshead in the back yard, where it quickly curdles, and from which it is used as needed throughout the year.

*Milk a Natural Food for Infants, but not for Adults.*—That milk is the natural food for the young of all warm-blooded animals is a physiological fact which no one will undertake to dispute. It is the first nourishment of the young animal, and continues to be the only food adapted to its wants for the first few months of its existence. It must be remembered, however, that each species of animals is provided with digestive organs peculiar to itself, and that the milk of each species is exactly adapted to the digestive organs which are to receive it, and to no other. Every nurse knows the injurious effects of cow's milk when given to an infant as a substitute for mother's milk without some modification, as by the addition of ordinary water, barley water, or some other diluent. Cow's milk differs very materially from mother's milk, containing less sugar, more fat, and four times as much casein as mother's milk. The casein in cow's milk also differs from that in moth-

er's milk, in that it forms large, firm, tough curds, whereas those formed in mother's milk are small, soft, and friable, crumbling easily into small particles under the action of the stomach.

It will thus be seen that the popular notion that since milk is the natural food of infants, cow's milk must be the most wholesome and easily digested of all foods for adults, is without proper foundation. When pure cow's milk is fed to infants, the child not infrequently vomits fragments of decomposing curds, which, after having remained many hours in the stomach, are still hard, tough, and leathery. Every nurse is also familiar with the fact that the bowel discharges of children fed upon cow's milk often contain large quantities of tough, undigested curds.

In the stomach of the adult even larger and firmer curds are formed than in the stomach of the child, for the reason that milk is taken by adults as a beverage, and is swallowed rapidly, causing the milk to curdle in large masses. The greater acidity of the gastric juice in adults also has a tendency to harden the casein into firm, resisting masses, which are broken down by the gastric juice with very great difficulty.

Another fact of importance is that the stomach in infants is so formed as to allow its contents to pass readily out through the pylorus; thus normal food does not remain in the stomach of the young child more than one or two hours, at the end of which time it is passed on and is brought in contact with the active digestive fluids of the intestines, where the complete digestion of milk takes place, the work of the stomach being simply to prepare it for the digestive action of the intestines.

In the adult the stomach is somewhat pouched in the left portion, for the purpose of retaining the food for a longer time. In many adults, and in a large proportion of dyspeptics, there is also more or less dilatation of the stomach; and the organ losing its ability to promptly empty itself at the end of the two or three hours of preliminary digestion, the food not infrequently is retained from five to seven hours, and sometimes several days in a dilated stomach. The left, or cardiac, portion of the stomach, is in some cases of dilatation, so enlarged as to form a pocket, in which undigested food is sometimes retained not only for days, but for weeks. Several such cases have come under the writer's observation.

The casein of milk is a nitrogenous substance, closely allied to flesh, and readily undergoes decomposition, the same as meat, eggs, and other animal substances. Milk, unless sterilized, always contains putrefactive germs, which readily set up decomposition of the casein in the stomach when the milk is retained for more than two or three hours, or when the gastric juice is not sufficiently strong thoroughly to destroy these germs. Even sterilized milk receives, while passing through the mouth, a sufficient number of germs capable of producing putrefaction to cause the same results under similar conditions, although, of course, the smaller the number of germs, the less likely the occurrence of these undesirable changes.

*Milk the Cause of Biliousness.*—In these facts we find a ready explanation of the influence of milk in producing the condition commonly termed "biliousness." Indeed, this is a matter of so common observation that, according to the writer's experience, the majority of persons suffering from attacks of bilious headache, sick-headache, or from chronic biliousness, on being questioned respecting the matter, remark that they have found it necessary to discard the use of milk as one of the articles most active in bringing on fresh attacks or aggravating the condition already existing. The observation that milk produces biliousness has given rise to the popular idea that it is bad for

the liver. The fact is that milk has no special influence upon the liver directly, but in the manner explained is liable to give rise to a state of putrefaction in the stomach, which of course disturbs the liver secondarily.

The writer has become thoroughly convinced that there are few persons who do not suffer sooner or later from the long-continued use of cow's milk.

*Milk the Cause of Nervous Headache, or Migraine.*— That the free use of milk as an article of food is one of the most prolific causes of migraine (nervous or sick-headache) the writer has had many opportunities to demonstrate in the treatment of patients suffering from this disorder. The simple prohibition of milk has cured many sufferers from this most distressing ailment. Examination of the stomach in these cases generally shows that it is dilated or prolapsed to such a degree as to cause retention of the food beyond the ordinary period.

That milk leads to decomposition in the stomach and the production of poisons by the absorption of which sick-headache and other distressing symptoms are produced, is doubtless due to the fact that it contains, as ordinarily received by the consumer, such multitudes of microbes. Professor Conn found that the milk obtained at Middletown, Conn., contained, within two or three hours after being drawn, from 330,000 to 9,000,000 microbes per ounce. The milk supply of Boston was found to be infected to a much greater degree, as many as 135,000,000 germs being found per ounce in some specimens. The milk of Madison, Wis., during the months of May and June, was found to contain 60,000,000 microbes per ounce.

The milk supply of European cities has been found infected to a much higher degree, the number of microbes being rarely less than 150,000,000 germs per ounce, and often reaching as high as 600,000,000, and sometimes to the enormous number of 5,400,000,000, in a single ounce.

The number of different kinds of microbes found varies from a half dozen or more to as many as fifty in a single locality. One German investigator found sixty-nine different kinds of microbes in a series of cheeses. These germs give rise to the so-called "ripening" of cheese, as it has been found that cheese cannot be made from boiled or sterilized milk.

*Vegetable Substitutes for Milk.*— Some years ago Sir B. W. Richardson, the eminent London physician, prophesied that the time would come when milk, as well as all other forms of animal food, would be derived directly from the vegetable kingdom. Many savage tribes obtain supplies of milk from vegetable sources.

The milk of the cocoanut furnishes a satisfactory substitute for cow's milk to the teeming millions of many tropical countries; while the cow-tree of South America provides a vegetable milk so rich in fatty matter that it might be more properly termed vegetable cream.

All nuts contain fats in a state of emulsion, and also a large percentage of proteid matters. By crushing and mixing with water, a solution closely resembling milk may be made from most kinds of nuts. The amount of fat and of proteid substances contained in such a solution does not differ very greatly from the proportions in which they are found in milk. The chief deficiency is in sugar. By the addition of a proper amount of sugar, preferably levulose or maltose, a very perfect substitute for milk may be produced. Such a preparation may be made from almonds in such a manner that it will contain all the elements of nutrition, and in proportions better adapted to the wants of human beings than does cow's milk. The fat which it contains is present in a state of perfectly natural emulsion. The proteid or albu-

minoid elements, corresponding to the albumin and casein of milk are practically identical with the casein of mother's milk, and form in the presence of an acid extremely fine and soft curds, which break up with the greatest readiness. In this respect it is even superior to the natural food of the human infant.

In experiments which we have made with nut milk we find that it has a delicate, delightful flavor, with a suggestion of its nutty origin, but resembles cow's milk very closely indeed. It agrees with the most delicate stomachs, and can be taken with perfect impunity by persons who cannot take cow's milk or cream even in the smallest quantities without suffering more or less severely in consequence. Added to cow's milk in proper proportion, lac vegetal, or nut cream, prevents the formation of hard curds in the stomach, as when the cow's milk is used alone. This renders it an exceedingly valuable food for infants,— vastly superior to any infant's food which has been devised.

Nuts are unquestionably the vegetable analogue of meat and other animal foods, not only containing all the food elements to be found in animal products, but in finer and more digestible form, more delicately flavored, and wholly free from the deleterious elements which abound in meat, and which are closely associated with all forms of animal food. Nuts and fruits are stated by the most eminent comparative anatomists to be the natural diet of man, as they are of his primitive relatives, the gorilla, the orang-outang, and the chimpanzee; hence it is not surprising that nuts should prove to be not only a perfect complement to a healthful dietary, but a food which is not only agreeable to the palate but acceptable to the stomach, even when it is so diseased that other less natural foods are rejected.

The general prejudice against nuts on the ground of their indigestibility is the natural outgrowth of the attempt to use them in a perfectly natural state, with no preparation except such as can be given by the teeth. With an entirely healthy stomach and sound teeth, this preparation is generally sufficient, but experience has shown that the digestibility of most nuts is as much improved by artificial preparation and cookery as is that of vegetables and other food-stuffs.

## SPECIAL HOSPITALS FOR CONSUMPTIVES.

THE medical profession is becoming fully aroused to the fact that consumption is a more dangerous disease than leprosy, being more contagious, and almost equally fatal, unless controlled by special climatic conditions or those which can be received only in a well-equipped hospital. The public is also becoming acquainted with the importance of restricting this disease, which is as certainly communicable as smallpox, diphtheria, or scarlet fever, and which destroys each year, on an average, one seventh of all persons who die, or many more than any other known disease.

More than a century ago, the authorities of Naples, Italy, established a hospital for the cure of patients suffering from pulmonary tuberculosis, or consumption of the lungs. Our state and city authorities are just beginning to recognize the importance of a return to this very proper method of dealing with this dread disease. England has for many years provided for the consumptive poor who are not able to obtain the advantages of a change of climate, and in this manner furnishes at the present time free beds for more than seven thousand such patients.

The following is an abstract from a paper by Dr. J. F. Jenkins, of Tecumseh, Mich.: —

"It is now a well-known fact that wealthy tubercular patients or even those

of moderate means may prolong life, and in a certain percentage regain their former health, by a residence in a suitable climate; or they may receive treatment at home without endangering the public health. But there is in every community a large class of these patients without means; and it is these who are the means of spreading the disease. The state should provide such with proper treatment, and protect the public by having the tuberculous poor conveyed to a hospital devoted to this class of patients.

"Over a century ago England began building hospitals for consumptives, and at present there are eighteen hospitals, containing over seven thousand free beds, for tuberculous patients, the result of which has been to materially lessen the death-rate from pulmonary tuberculosis in that country."

"From statistics taken from the *Progris Medical*, the death-rate in 1870 in England and Wales was 2410 for each 1,000,000 inhabitants; but since consumptives have been treated in special hospitals, this number has fallen to 1468, in 1893. If this report be correct, England saves the lives of 20,000 of her inhabitants yearly, by wise sanitary measures in maintaining special hospitals for her dependent class of consumptives.

"In this country a number of private hospitals and sanitariums have been built for the purpose of caring for this class of patients, and reports from these various institutions show very gratifying results, the number of cures ranging from twenty to forty-five per cent. The Massachusetts legislature has recently appropriated $150,000 for her tuberculous poor.

"The State Board of Health had a bill before the last Michigan legislature asking for an appropriation for this purpose, and it is to be hoped that the next legislature will do so. Money used in such ways comes back to the people many fold."

The management of the Battle Creek Sanitarium has recently established a finely equipped sanitarium at Boulder, Colo., where special attention is given to the treatment of those suffering from lung troubles, in connection with the general work of a sanitarium. The institution is a self-supporting philanthropy, and consequently cannot be wholly devoted to the treatment of the sick poor, but all its surplus earnings will be used in this manner, and as soon as possible, quite extensive provisions will be made for this class. Here is a most excellent opportunity for persons charitably inclined to make investments in the interests of suffering humanity.

While but a small proportion of cases of lung disease can be cured in the East, it is unquestionably true that an altitude of five thousand feet is of immense advantage in the treatment of this insidious malady. More than twice as large a proportion of cures can be effected than at lower levels. We expect to see the work at Boulder develop into a great philanthropy in the interests of this class of sufferers.

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**Good News for Women.**— The surprising news comes from Paris that the fashionable women of that fashionable city, who set the styles for the whole world, have demanded an increase of waist-room to the extent of three or four inches, and that the next season's fashion plates will be especially characterized by largeness of waist. The modistes have at last discovered that the Venus de Milo rather than the French corset is the proper model as regards a woman's form. This wonderful change is said to have been brought about by the addiction of the "new woman" of France to the use of the bicycle. The tips of the handles of the breathing bellows are placed at the waist, and waist-constriction thus effectually interferes with respiration. The lady bicyclist who wishes to keep up with the procession must enjoy free movement for her respiratory machine, as well as

for her pedal extremities; and consequently she has rebelled against waist constriction so far as to construct a special dress for bicycle-riding and other modes of outing; and after the enjoyment of the freedom thus obtained, she refuses to go back into her cage. If American women will show themselves as ready to adopt the new Parisian dress reform as they have heretofore been to imitate every folly emanating from the stage and the demi-monde of gay Paris, we shall witness within the next six months a mighty revolution in the conventional styles of dress in this country. Fashion-makers can do more in a week in the reformation of women's dress than all the doctors, dress-reform clubs, lecturers, and other reform agencies can accomplish in half a century. Women may well rejoice in the prospect of a time when they will have a chance to "breathe like a man" without being criticized as being "mannish."

**The Source and Nature of Potential Energy Utilized for Muscular Labor.**— Professor Chauveau, in connection with Drs. Tissot and De Varigny, recently presented before the Academy of Sciences in Paris, an exceedingly interesting study of the above subject, which shows that the potential energy directly utilized by the muscles of the laborer and of the fasting man is never furnished by fat, but that it is derived by the muscles directly from the carbohydrates, the muscular work gradually exhausting the store of glycogen and glucose, the source of this potential energy.

The muscular energy is maintained by the transformation of fats into carbohydrates, which in turn become the source of energy. So the fats are thus used indirectly as a means of supporting muscular work, but only after they have been assimilated. The experiments made show that even when the blood is saturated with fatty elements introduced by digestion, no portion of the same is utilized for muscular work except such as has been assimilated, or incorporated into the tissues of the body. These experiments furnish an indirect proof that alcohol cannot be a food or a source of energy, since no evidence has ever been afforded that alcohol, either without or within the body, can be converted into glycogen or glucose, from which the muscles derive their energy. If the body cannot utilize the energy of natural food substances, like fat, until after it has been assimilated and converted into carbohydrates, it could not be expected that alcohol, an artificial, unnatural substance, a product of the action of micro-organisms in the decomposition of food substances, could be thus utilized without first being assimilated; and since it cannot be assimilated, the fair conclusion is that it cannot be used at all.

## REVIEWS.

PRINCIPLES OF BACTERIOLOGY.— By A. C. Abbott, M. D., Philadelphia, Lea Brothers & Co.

This practical manual of bacteriology for students and physicians has reached its third edition within four years of its first publication, an evidence, certainly, of the great favor with which it has been received by the profession. The work is not merely a technical description of bacteria, but an elaborate treatise, intended to serve as a complete manual for the laboratory. The descriptions of methods and technique are extremely lucid and complete. The illustrations are excellent. Dr. Abbott has had an extended experience in bacteriology as first assistant in the laboratory of hygiene in the University of Pennsylvania, one of the most amply equipped institutions in the world. This edition of the work has been thoroughly revised and considerably enlarged, and is fully abreast with the present status of the rapidly growing subject of bacteriology. We know of no other work which we can more heartily commend as a student's manual.

PTOMAINS, LEUCOMAINS, TOXINS, AND ANTITOXINS; OR THE CHEMICAL FACTORS IN THE CAUSATION OF DISEASE.— By Victor C. Vaughn, Ph. D., M. D., professor of Hygiene and Physiological Chemistry, and Frederick G. Novy, M. D., junior

professor of Hygiene and Physiological Chemistry in the University of Michigan. New (3d) edition. In one 12mo. volume of 603 pages. Cloth, $3.00. Philadelphia, Lea Brothers & Co., 1896.

The names of the authors of this work are a sufficient guarantee of its accuracy and its practical value. It stands alone, so far as we know, as an exhaustive treatise upon the subject of bacterial poisons, and is invaluable to English readers as the only accessible work affording reliable information upon this subject of growing importance. It should be read and studied by every physician as well as by medical students. No physician at the present time can pursue the practise of medicine in an intelligent manner without a knowledge of the important facts presented in this work. That a large measure of appreciation is accorded it by the medical profession is shown by the fact that it has already reached its third edition. The authors deserve, in addition to the reward of a large circulation for their work, the thanks of the profession for the enormous amount of painstaking research and original investigation which has enabled them to produce this elaborate treatise. We are glad to note that the present edition includes a very excellent summary of the important facts presented in Bouchard's admirable work, "Les Auto-Intoxications."

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THE CHANGES IN THE PROPORTIONS OF THE HUMAN BODY DURING THE PERIOD OF GROWTH.— By W. S. Hall, Ph. D., M. D., Chicago, Ill.

Dr. Hall, the author of this pamphlet, has had exceptional opportunities for the study of the bodily changes during growth, from the standpoint of the physiologist, and has, in this paper, made an exceedingly interesting summary of the enormous amount of data which he has collected, from which he has deduced several important and interesting laws. As relates to growth, the author has discovered that "when the vertical dimensions of the human body is undergoing an acceleration of its rate of growth, the horizontal dimensions undergo a retardation of their rate of growth; and the reverse." In a study of the relation of lung capacity to weight, to volume, and to strength, the author concludes that "the lung capacity varies with the strength." Whether or not the latter law is true, we are somewhat in doubt, as the tests of muscular strength were not sufficiently thoroughgoing to give a true idea of the total strength of the body, the tests being applied only to the back, the extensor muscles of the thigh, the pectoral muscles, the flexor muscles of the forearm, and the extensor muscles of the upper arm. A more extended study of this subject by the aid of data obtainable by a dynamometer capable of measuring the strength of each of the principal groups of muscles might give different results.

VAGINAL HYSTERECTOMY.— By Francis D. Holbrook, M. D., Chicago, Ill.

This paper describes what is known as "Pratt's Method of Vaginal Hysterectomy." The method seems a satisfactory one, although we do not know to what degree Dr. Pratt is rightfully entitled to his claim of originality.

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SYPHILIS OF THE VITAL ORGANS, AND THE THIRD ACT OF THE DRAMA OF SYPHILIS.— By Henry Alfred Robbins, M. D., Washington, D. C.

These two papers, reprinted from the *Virginia Medical Monthly*, indicate very clearly that the author is master of his subject, and give evidence of extended bibliographical research in addition to clinical observation.

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THE EXPERIENCE OF SEVERAL PHYSICIANS WITH SERO-THERAPY IN TUBERCULOSIS.— By Paul Paquin, M. D., St. Louis, Mo.

Dr. Paquin is an enthusiastic student of serum-therapeutic treatment in tuberculosis, and has done a large amount of painstaking work in the interests of this new therapeutic procedure. A number of cases are reported in this paper in which the remedy seems to have been helpful.

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THE FREQUENT DEPENDENCE OF INSOMNIA, MENTAL DEPRESSION, AND OTHER NEURASTHENIC SYMPTOMS UPON DISEASE OF THE GASTRO-INTESTINAL TRACT.— By Boardman Reed, M. D., Atlantic City, N. J.

This excellent paper contains the practical experience of a practical man, who enjoys exceptional opportunities for observation of the class of invalids of which he writes. Dr. Reed has made a careful study of the disorders of the gastro-intestinal tract, both in this country and in Europe. Notwithstanding the demands of an enormous private practise, he finds time for the careful scientific research upon which he bases the conclusions presented in this paper. This subject is one which ought to be more carefully studied. Thousands of patients are being treated by neurologists for disorders of the nerves, without success, who might easily be relieved of their sufferings and the disturbing symptoms present, by a recognition of the fact that the great majority of functional nervous disturbances are merely the expressions of a disordered intestinal tract. The sooner physicians find out that neurasthenia is not a disease, but a symptom of disordered nutrition, the better it will be for a multitude of sufferers who are now being "toned up" and "toned down" by "nerve fooling" remedies of various sorts, which afford temporary relief only at the expense of incurring greater suffering in the end, and rendering the disordered conditions present more persistent and difficult of cure.

# The Battle Creek Sanitarium
# LABORATORY OF HYGIENE.

J. H. KELLOGG, M. D., Superintendent.
GEO. H. HEALD, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
A. B. OLSEN, B. S., M. D., Pathologist.
W. A. GEORGE, M. D., Chemist.

**Monthly Résumé of Work Done.**

## REPORT OF EXAMINATION OF BLOOD.

FOR AUGUST.

| Blood Count. | Men. | Women. | Total. |
|---|---|---|---|
| Over 5,000,000 | 1 | 1 | 2 |
| Between 4,500,000 and 5,000,000 | 88 | 16 | 104 |
| " 4,000,000 " 4,500,000 | 16 | 44 | 60 |
| " 3,500,000 " 4,000,000 | 2 | 8 | 10 |
| " 3,000,000 " 3,500,000 | 1 | 2 | 3 |
| " 2,500,000 " 3,000,000 | 0 | 1 | 1 |
| " 1,500,000 " 2,500,000 | 4 | 0 | 4 |
| Totals | 112 | 72 | 184 |

| Hemoglobin. | Men. | Women. | Total. |
|---|---|---|---|
| 100 per cent. | 71 | 46 | 117 |
| 93 " " | 18 | 27 | 45 |
| 85 " " | 6 | 8 | 14 |
| 78 " " | 1 | 2 | 3 |
| 72 " " | 1 | 0 | 1 |
| 65 " " | 1 | 0 | 1 |
| 57 " " | 3 | 0 | 3 |
| Totals | 101 | 83 | 184 |

**Gastric Laboratory Report for August.**— Regular analysis, 205; experimental, 8. The cases are from the following States and countries: Michigan, 41; Illinois, 38; Ohio, 27; Iowa, 15; Nebraska, 9; Indiana, 9; Texas, 7; Minnesota, 6; Kansas, 5; Kentucky, 5; Pennsylvania, 5; South Dakota, 4; Tennessee, 3; New York, 3; Vermont, 3; Wisconsin, 3; Louisiana, 2; Massachusetts, 2; Colorado, 2; California, 2; Alabama, 2; Canada, 2; Georgia, 2; District of Columbia, 1; West Virginia, 1; North Carolina, 1; North Dakota, 1; Connecticut, 1; Idaho, 1; Montana, 1; New Zealand, 1. Total, 205.

**Bacteriological Examination of Stomach Fluid for August.**— Total number of examinations made, 223. Eight of these were experimental.

Seventy-four injections were made into guinea-pigs of bouillon cultures from stomach fluids, in amount varying from 2 to 6½ c.c. Death occurred in 24 cases; mortality, 32 per cent.

**Sputum Examinations for August.** — There were 39 examinations made, 33 of which were of new cases. Tuberculosis bacilli were found in 8 cases, 5 of which were new.

**Urinary Laboratory Report for August.**— Number of specimens examined, 368; number of cases, 300. Number of cases in which blood was found, 7; albumin, 23; pus, 66; casts, 4; sugar, 7; bile, 5. Number of cases tested for toxicity, 16; number of specimens tested for toxicity, 18.

# PUBLISHERS' DEPARTMENT.

THE Tri-State Medical Society, of Alabama, Georgia, and Tennessee, will hold its next annual meeting at Chattanooga, Tuesday, Wednesday, and Thursday, Oct. 13–15, 1896.

The program already includes twenty-nine interesting papers by eminent physicians, and is still growing.

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THE PAN-AMERICAN MEDICAL CONGRESS.— Through the energetic efforts of Dr. Charles A. L. Reed, Secretary of the International Executive Committee, and others, an arrangement has been made for a Pan-American Medical Congress to be held in the City of Mexico, Nov. 16–19, 1896. The vigorous manner in which arrangements for this congress have been pushed has already secured a splendid program, and there is every reason to believe that the meeting will be a most unqualified success. Those physicians who had the pleasure of attending the meeting of the American Public Health Association held at the City of Mexico a few years ago will be happy to embrace this opportunity to renew their acquaintance with our affable and warm-hearted Mexican confrères. Certainly no scientific body has received a more cordial welcome or a more brilliant reception than was accorded the American Public Health Association, and without doubt the Pan-American Medical Congress will be equally well treated. Dr. Reed announces the following arrangements respecting transportation :—

"Dr. H. L. E. Johnson, 1400 L street, N. W., Washington, D. C., has been elected chairman of the special committee on transportation. All communications relative to rates, reservation in the special trains, etc., should be addressed to him. A rate of one fare for the round trip has been secured between St. Louis, New Orleans, and other trans-Mississippi points and the City of Mexico. It is confidently expected that this rate will be extended over the entire territory of the United States. Arrangements are in progress for a splendidly equipped train of sleeping and observation cars, with first-class dining-car service. Dr. Johnson will presently be in position to announce a rate, which will include railroad fare, sleeping and dining car service both ways and in the City of Mexico, and covering the expenses of various side trips to the most important historic points in the republic."

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DR. W. J. HARRIS, a surgeon of St. Louis, MO., desires to announce his removal from 3107 Morgan street to 3514 Lucas avenue, of the same city.

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# Ladies' Guide in Health and Disease

**GIRLHOOD, MAIDENHOOD, WIFEHOOD, MOTHERHOOD.**

**BY J. H. KELLOGG, M. D.,**

Member of the American Medical Association, American Public Health Association, American Microscopical Association, American Association for the Advancement of Science, American Association for the Advancement of Physical Education, The Society of Hygiene of France, International Periodical Congress of Gynecology, Editor of Modern Medicine, Superintendent of the Battle Creek (Mich.) Sanitarium.

Every physician has sometimes felt the need of a work relating to woman and her physical relations, written in untechnical language, which he could place in the hands of his lady patients as a means of communicating to them information respecting the special functions of their sex, thereby enabling them to better co-operate with him in his efforts to restore them to physical soundness. This work is admirably adapted to meet this need. It has already served a like purpose in thousands of instances, and has the hearty commendation of hundreds of physicians.

It tells mothers *just what they ought to know*, and daughters who value their health, cannot afford NOT to know what this book teaches them. The work is appropriately illustrated by means of **28 chromolithographic plates, cuts and colored plates.** Complete in one volume of 672 octavo pages, printed on fine paper, and beautifully and substantially bound.

**Cloth, embossed in gold and jet,** **Half Morocco, gilt edges,**
**Leather (library style),** **Full Morocco, gilt edges.**

***MODERN MEDICINE PUB. CO.,***

***65 Washington St.*** ***BATTLE CREEK, MICH.***

# DIRECTORY OF SANITARIUMS.

THE following institutions are conducted under the same general management as the Sanitarium at Battle Creek, Mich., which has long been known as the most thoroughly equipped sanitary establishment in the United States. The same rational and physiological principles relative to the treatment of disease are recognized at these institutions as at the Battle Creek Sanitarium, and they are conducted on the same general plan. Both medical and surgical cases are received at all of them. Each one possesses special advantages due to locality or other characteristic features.

## ST. HELENA SANITARIUM, OR RURAL HEALTH RETREAT,

ST. HELENA, CAL.

W. H. MAXSON, M D., Superintendent.
IRVING E. KECK, Business Manager.

THIS institution is beautifully located at the head of the Napa Valley. It is a fine large building, with excellent appointments, and all facilities required for the treatment of chronic invalids of all classes. It has also a record for a large amount of successful surgical work. There are several able physicians connected with the institution. The scenery is delightful, the climate salubrious; the water supply, which is furnished by mountain springs, is pure and abundant. Hundreds of cases of diseases generally considered incurable have been successfully treated at this excellent institution during the twenty years of its existence.

## CHICAGO SANITARIUM,

28 COLLEGE PLACE, CHICAGO, ILL.

THIS institution is a branch of the Battle Creek (Mich.) Sanitarium. It is favorably located near Lake Michigan, in the southern portion of the city, close to Cottage Grove avenue, and facing the old Baptist University grounds. A few patients are accommodated. Facilities are afforded for hydrotherapy, and the application of massage, electricity, Swedish movements, and other rational measures of treatment.

## NEBRASKA SANITARIUM,

COLLEGE VIEW (LINCOLN), NEB.

A. R. HENRY, President.
A. N. LOPER, M. D., Superintendent.

COLLEGE VIEW is a thriving village located in the suburbs of Lincoln, with which it is connected by an electric railway. College View is the seat of Union College, one of the leading educational institutions of the West. The Sanitarium has a beautiful location, facing the spacious college grounds, and gives its guests the advantages of a quiet, homelike place, combined with appropriate and thoroughly rational treatment. It has a full equipment of excellent nurses, and has already won for itself an enviable reputation in the West.

## PORTLAND SANITARIUM,

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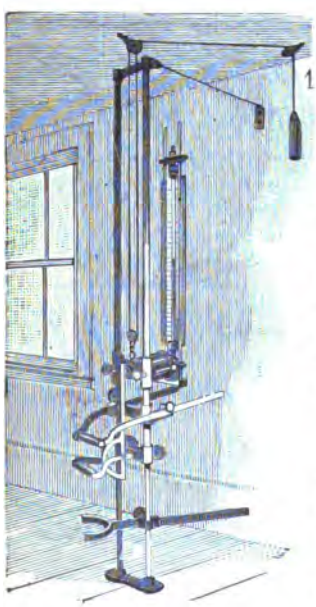

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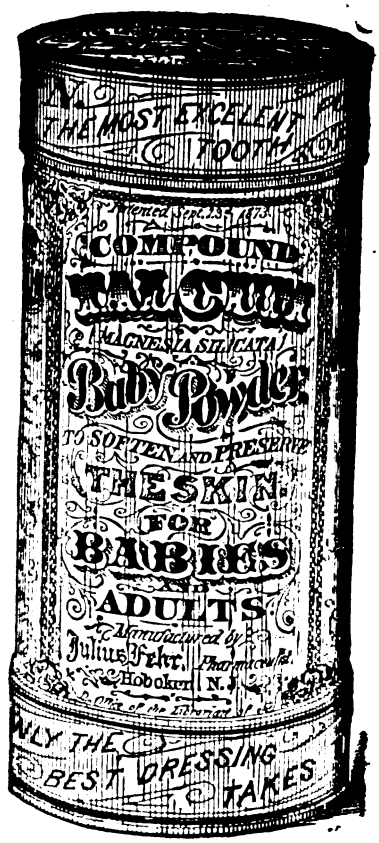

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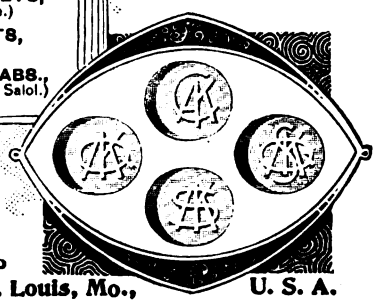

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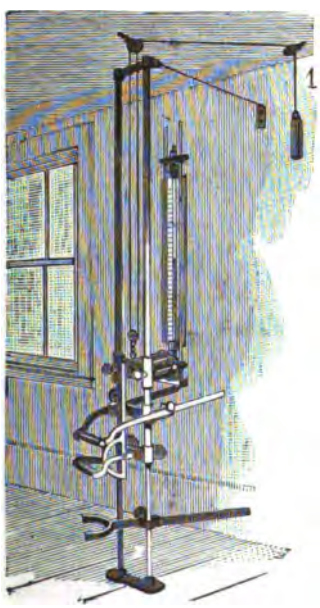

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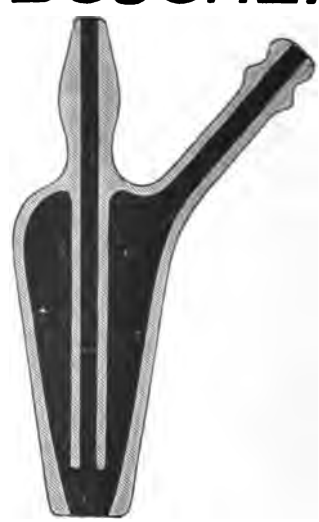

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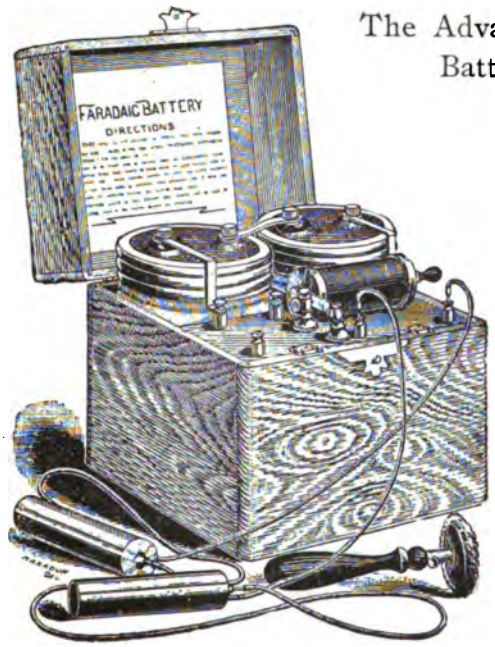


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# BACTERIOLOGICAL REVIEW.

VOL. 5. BATTLE CREEK, MICH., U. S. A., OCTOBER, 1896. NO. 10.


## ORIGINAL ARTICLES.

### SCOLIOSIS AND ITS TREATMENT BY MEANS OF GYMNASTICS.


BY DR. T. J. HARTELIUS.

Translated by Dr. David Paulson.


(*Continued.*)

*Relaxation and Extension of the Muscles of One Side.*— Here is an important question in regard to the pathogenesis and causes of scoliosis. If it is a physiological truth that there is required, for the maintenance of the erect position of the spinal column, an equilibrium between the activity of the muscles of the two sides, then it follows, as a pathological necessity, that upon a diseased relation of the muscles of one side and the normal condition of those on the opposite side, the spinal column must be bent with the convexity toward that side where the weakened muscles are found. The weakness may be greater or less, and in proportion as it exists will be the extent of the curvature. If the muscles cannot be spontaneously relaxed, they will remain in contraction upon the concave side. (This contraction must not be confused with the already mentioned permanent retraction of Guerin. This latter is a pathological condition, and myotomy is indicated; the former is physiological, and disappears with the renewal of functional activity upon the convex side.)

But what is the cause of the weakness of the muscles of one side? The S-formed scoliosis rarely appears before the sixth to the eighth year, and then takes the definite form, with the upper convexity to the right and the lower to the left, so that the opposite form, with the upper curve to the left and the lower to the right, should be merely considered as an exception. The single scoliosis passes through a transitional stage to the S-form, and even in those cases where it seems to be single, or C-form, it is generally only apparently single, having one or two small combination curvatures, or a tendency thereto. To accept any of the causes given by the previously named authors as general causes for scoliosis, is opposed to the typical character of the disease. That the muscles upon the convex side, through constant extension, should be weakened, follows as a physiological necessity. That these weakened muscles pass from a physiological to a pathological condition is a foregone conclusion. The solution of the problem depends upon what it is that produces weakness in certain muscles, and thereby disturbs the equilibrium of the spinal column. Can we not, in studying these conditions in practical life, find an answer to the question?

If we observe the condition of the back in a person who writes in the usual position by a table, by which, as is often the case, the right arm and elbow are raised from the side, and the left arm and elbow lie against or near the side, we will see the back curved in the dorsal region, with the convex side to the right. This is most plainly seen in weak and relaxed individuals. It is not altogether improbable or impossible that this position may produce a temporary double curvature, with opposite convexities. The position described is one quite generally taken by students in school. In the common, elementary, and industrial schools there are furnished a large number of observations in this respect. It is no doubt true that instructors give attention to position now more than formerly, but to entirely remedy crooked positions is a delicate, if not an impossible undertaking.

Dr. Ellinger has also, in his writings,

called attention to the optical condition. If the paper which is used lies, as is usual, a little to the right of the writer, then the eye-muscles will be fatigued by looking downward and to the right, whereby their accommodation is disturbed and the sight becomes dim. To relieve this, the head is twisted to the right. Because the paper lies to the right, the left eye is farther removed from the type than the right, and the head must be turned so as to equalize the distance. But in order to read, the head must be rotated so that the lines of the book will be parallel with the line which connects the eyes. For this purpose it is necessary to twist the head so that the left eye comes farther back, and lower, while the right eye is brought forward. This produces a deviation of the shoulders and spinal column and of the pelvis.

This temporary and physiological curve passes, indeed, in a comparatively small number of individuals, into a permanent or pathological condition, as the spinal column is able to resist for a longer or shorter time the pressure of the unnatural position. But if there already exists a natural tendency to such curvature, this natural curve will pass much more readily into a pathological curve. Those tendencies which have the most potent influence may be named as heredity, muscular weakness, and the female sex. A certain position may readily become a habit, and finally one may so adapt himself to it as to become dependent upon it. Then this position will remain permanent, and it may be very readily understood that scoliosis is liable to arise from it.

As a negative proof of the fact that a defective position may give rise to scoliosis, we may mention the absence of these conditions in uncivilized nations. Alexander von Humboldt says that among the many thousands of Caribs, Indians, Mexicans, and Peruvians whom he observed during five years, he did not find one case of natural deformity.

*The Excessive Use of the Right Arm, as Compared with the Left.* — This condition is, without doubt, a contributing cause to scoliosis in its typical form. Some authors take the position that the use of the right arm more than the left develops the muscles upon that side more vigorously than on the left, and draws the vertebral bodies to the right. ❑ Lachais says in regard to common scoliosis, with convexity to the right side in the dorsal region, that it must be clear to all physicians that this spinal curvature is in nearly all cases the result of a greater amount of vital energy as a consequence of physical development in the right shoulder, caused by the tendency to use the right arm more than the left. Under these conditions the activity of the rhomboideus major, the serratus magnus, and the levator anguli scapulæ muscles of the right arm, exceeds that of the antagonizing muscles, and draws the scapulæ, when in a horizontal position, away from that line which represents the position in which their united forces tend to hold it.

This seems to be the condition, because the posterior half of the chest upon the right side is more protruding than the left side, and seems greater in comparison with the left. The muscles on the left side also seem diminished as compared with the corresponding muscles on the right side. A right conclusion in regard to this is very important in treatment. If the opinion already given is right, then the treatment must seek to strengthen the muscles upon the convex side — the left. But it may be the muscles upon the right side which have excessive activity, and have drawn the dorsal vertebræ to that side.

Every marked curvature is followed by a rotation of the body around the long axes, with the spinous processes directed toward the concave side. This fact is opposed to the idea that it is overaction of the muscles upon the right side which is the cause of the curvature.

The excessive use of the right arm does not directly tend to develop scoliosis, but the influence is none the less in this direction. The condition shows itself plainly. If one lifts a weight with the right arm, the back is bent with the concavity toward the left. It is the muscles upon the left side which bend the vertebral bodies of that side. Here is seen plainly the activity which shows itself in riding, and also in the daily life with its varied duties, which furnish numerous illustrations of the correctness of this conclusion. If one carries a weight on one arm, he will bend to the opposite side; if he carries a weight in front, he will bend backward; and if he carries a weight on his back, he will bend forward. This is a mechanical and physiological

law, which must of necessity become evident. By the carrying of any weight with the right arm,— and this of course happens in nearly all lines of work — the muscles upon the left side will be contracted, and the point of gravity drawn to the left in order to maintain mechanical stability, the muscles upon the right side being relaxed. The change in the beginning is of course physiological, but the relaxation may readily pass into a habit, and by a permanent weakening the muscles may lose the power to regain their normal position. The condition then becomes pathological.

*Resting upon One Leg, and Sitting in a Bad Position.*— When a person stands upon one leg, the back is bent in the lumbar region, and also to a greater or less degree in the lower dorsal part, with the convexity toward the side opposite that of the resting limb. Every one who has given attention to this question will observe that it is a common habit for people to rest upon one leg, principally the right. At the beginning, one will change from one limb to the other, but he will gradually accustom himself to depend more upon the right. Of course we might ask why it becomes a habit to rest upon the right limb in preference to the left. This may find its explanation in the fact that the right limb has acquired greater energy than the left, as is shown very clearly in the use of the right arm in preference to the left.

It may also be observed that in sitting, for example, by the school-desk, the body is often held in a bad position in regard to the pelvis, so that the trunk rests only upon one half the buttocks, generally the right. This also, in some cases, gives rise to curvature in the lumbar region, with convexity to the left. That the acquiring of a bad position occurs as the result of weakness in the muscles is shown by a careful examination of the sitting and standing positions of youth. If the bad position has become a habit and an organic physiological necessity, it will sooner or later become pathological, provided no appropriate means are used to prevent it.

We cannot, however, agree in all respects with Von Werner's statement, that common scoliosis depends upon a bad habit and moral defect in the will, and that both the preventive and the curative means should be moral.

If a curvature is present, a tendency to counter-curvature is set up. This will arise sooner or later if the primary curve is not met with efficient remedies. In a fully developed double curvature, it may be difficult, without special practise, to decide which curve is the primary; but in the early stages of scoliosis there is no difficulty, as in most cases it is assumed that the greater curve is primary. The determining of this point has, however, no special bearing upon the treatment. That the lumbar curve, according to Malgaine, is seldom the primary does not agree with my own experience, according to which the curve in the dorsal region is the most frequent; but it is not at all rare for the first curve to begin in the lumbar region. That the primary curve is followed by a secondary or counter-curve depends upon whether the cause for the secondary curve lies in the primary curve. Through the primary curve the point of gravity is drawn to the side, causing a certain disturbance of the equilibrium of the head and trunk above the curve. Hence the greatest weight of these parts falls toward the concave side; and in order to counteract this condition, muscular activity is instinctively set up, which creates a curve counter to the primary. It is not impossible to demonstrate this. If the body be so poised as to produce a single curvature, then there will be shown a tendency in the lumbar region opposite that in the dorsal region.

The spinal rotation around the long axes of the vertebral bodies, with the spinous processes directed toward the concave side and the bodies toward the convex side, depends upon a well-grounded, definite cause. In a post-mortem examination, H. Meyer found that pressure upon the spinal column bent it to the side. There was some lordosis when the experiment was performed upon the spinal column of youth. There was, however, no rotation of the vertebral bodies upon their long axes in the spinal column of aged individuals. The scoliosis which arises in persons after the fifteenth year should therefore not be followed by rotation of the vertebral bodies, but scoliosis arising in young individuals should be followed by lordosis.

This, however, is altogether too much opposed to experience, for neither in the fifteenth year nor later are we free from vertebral rotation in scoliosis. A curva-

ture, even in the most severe degree, is quite frequently uncomplicated by lordosis. Whatever the given experiment does show, however, it seems that the result of exclusive mechanical power applied to a dead thing cannot have a full analogy in the living organism.

On the other hand, the mechanical physiological theory (Delpech, Pravay, Eulenburg, and others) seems, in regard to the origin of spinal rotation, to possess probability. As the secondary lateral curvature is a compensation, through the fact that the individual instinctively strives to bring the point of gravity to the middle of the standing-base, so also spinal rotation arises through the necessity of a compensation. Each time that the spinal column is strongly curved, the weight is brought to bear upon parts of the apophyses which are upon the concave side. There is thus insufficient support for the weight of the upper portion of the trunk. The weight and insufficiency of support are increased by the movement of the arm. Then, instinctively, the vertebral bodies rotate with the spinous processes toward the concave side, and the bodies toward the convex side. By this the apophyses come into such a position as to furnish a better support.

### THE PREVENTION AND TREATMENT OF SCOLIOSIS.

Can scoliosis be prevented? This question may be answered in the affirmative. In a predisposition to scoliosis, especially if inherited, lies the great tendency for its appearance. This may, however, be combated if we are early on the lookout for the slumbering enemy. I am not here speaking of those cases which occasionally arise as the result of temporary causes, as disease of the bone, pleuritic exudates, etc., but in regard to common muscular scoliosis.

So long as the equilibrium is maintained between the muscles of the opposite sides, scoliosis does not appear. Prevention of scoliosis must therefore be employed for the maintenance of this equilibrium. This may be done partly by the negative method of avoiding an improper position in sitting or standing, and one-sided body movements, and partly—chiefly—by appropriate hygienic means. To these latter belong good food, fresh air, tonic baths, and appropriate gymnastics. *I have never yet known scoliosis to occur when gymnastics had been systematically used from the earlier years.* By the exercise of a firm will, the development of scoliosis may be prevented by the exercise of suitable body movements, which may readily be carried out even in the home. For example, the following may be used: Standing, arm-raising; forward-lying; stretch-standing; knee-bending; side-lying, rising; standing, arm-bending and stretching upward and outward; neck-firm, twisting; standing, arm-swinging.

That scoliosis arises so seldom in boys in comparison with girls, is no doubt due to the fact that boys are accustomed to more vigorous physical exercise than girls. Scoliosis very often occurs among the working classes, who have, during their growth, been deprived of gymnastics. By this we are reminded of the necessity of furnishing a thorough course of gymnastics for the common schools. Here it is of the greatest importance to prevent scoliosis, because, for several reasons, we meet with greater difficulty in its cure when it is overlooked in the earlier stages; and then when it is developed, it requires a period of time for treatment which circumstances often do not allow.

In the treatment of scoliosis both the orthopedic method and the gymnastic method have been used, and sometimes both together. The orthopedic method is the oldest, but it has become less common as the other method has acquired greater confidence. The former method lacks particularly in this, that although it may, by external mechanical force, extend the spinal column, it does not thereby strengthen the organism. Subsequent to the passive straightening, the organism could exercise its resisting power, and thus hinder the spinal column from regaining its former position. Even if it be admitted that the mechanical apparatus is well constructed, and is not in itself injurious to the organism, yet if it be used alone, its useful influence is doubtful, as the strength of the organism is not thereby rendered more competent to maintain the proper position of the spinal column. This method has made no progress in Sweden.

Does the gymnastic method show any deficiencies in its results? and does it require the assistance of mechanical means? The practical treatment of scoliosis con-

sists, in many places, exclusively of the gymnastic method, while in other places the two methods are connected in treatment. Two methods which are partly alike, but different in some particulars, cannot be equally good. Can the gymnastic method be supported and the cure assisted with the co-operation of supporting apparatus? If so, it becomes a great wrong not to utilize these, and responsibility rests upon those who do not make use of them in the gymnastic treatment of scoliosis; for it is an undeniable duty to use the best legitimate and useful means attainable for the restoration of health.

For the proper treatment of scoliosis, a right conception of the anatomico-pathological condition is necessary. If the muscles upon the convex side are weakened or pathologically changed, those upon the concave side remaining normal or with very little disturbance of nutrition, then it is clear that the diseased muscles must be restored, strengthened, and developed. This cannot be done by simple mechanical extensions. For the restoration of the weakened or pathologically changed muscles, two means are used, — muscular movements and electricity, — but for the restoration of a deformity of the spinal column, extension is required.

The question arises, therefore (and it is a question that must be settled), whether external mechanical means are necessary for this extension, or whether it can be done by the individual's own efforts. This is not difficult to demonstrate. In slight cases of lateral curvature, where no deformity has taken place in the vertebræ, the spinal column is straightened at every stretching of the back. By bending toward the side of the convexity, the curvature of the back is not only corrected, but it may be bent to the opposite side, showing an extension in the highest degree. In those cases where the deformity in the vertebral bodies makes a complete extension of the spinal column impossible, a complete straightening of the spinal column may often be effected by personal efforts. This is shown in such exercises as standbending; back-raising under resistance at the neck; hanging, neck-bending; forward-lying; and others. No external mechanical means are capable of stronger extension upon the curvature than these and some other active movements.

(To be continued.)

## NON-SURGICAL TREATMENT OF THE PELVIC DISORDERS OF WOMEN.[1]

BY J. H. KELLOGG, M. D.,
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THE great advances which have been made in recent times in surgical technique, and especially the great decrease in risk from surgical procedures secured by asepsis, have led to a very great extension in the domain of surgery, and especially that department of surgery which relates to the diseases of women. Gynecological operations which a few years ago were considered too hazardous to be attempted by any except a few bold and experienced operators, and then only in cases in which loss of life or total disability could be prevented by no other means, are now undertaken by almost every surgeon and by gynecologists of little or no experience, and in cases in which a dozen years ago no reputable surgeon would have dared to advise an operation of so grave a character. Not only ovariotomy but hysterectomy is now performed by some surgeons with even less consideration than surgeons formerly gave to the matter of the removal of a toe or the tapping of a dropsical abdomen; while such operations as the repair of a torn cervix or a lacerated perineum have come to be regarded as minor operations, requiring scarcely more thought than the removal of a corn or an ingrowing toenail. It is the opinion of the writer that a vast amount of unnecessary gynecological surgery is being done at the present time, not dishonestly or even carelessly, perhaps, but because operation is easy, more often brilliant in its results, and has come to be something of a fad. The modern gynecologist is necessarily a surgeon; and a surgical training naturally tends to create a dislike for the slow and tedious methods of non-surgical treatment, while the physician's increasing skill gives him not only an increased aptitude for surgical measures, but an increased disposition to apply the surgical method whenever possible or allowable. His dexterity with scissors and needle renders it almost an actual distress to him to allow a perineal tear or a cervix laceration, even though very small in extent, to escape

[1] Reprinted from the Transactions of the Michigan State Medical Society, June, 1896.

surgical attention, without taking into consideration the bearing which the slight injury may have upon the health or comfort of the patient.

I am not disposed to be cynical nor to criticise in an unfriendly way any medical brother, but the immense strides made by gynecological surgery in recent times have overshadowed non-surgical methods, and there appears to be a real necessity for greater attention to the development of non-surgical therapeutics in gynecology, and for a revision of some of the views which have heretofore been maintained respecting the bearing of slight injuries of the pelvic structures to various other and remote pathological conditions.

Many experienced gynecologists have become skeptical respecting the awful consequences which have been so graphically pictured as likely to result from a small cicatrix in a cervix or a perineum. For myself I must confess that I have never yet seen any serious reflex phenomena resulting from such a condition, and do not see any good reason why such a cyclone of reflex effects as has been pictured to us should arise from a scar in the cervix or perineum any more than from a scar on the palm of the hand or the tip of the tongue. I am glad, at least, to say that more than a dozen years ago I ceased to operate on the cervix or the perineum simply for the removal of scars; in fact, I am glad to say that I never did much of that kind of surgery.

I think, also, that I am correct in believing that quite a large proportion of observing gynecologists are coming to attach far less importance to small lacerations of the perineum as factors in the production of uterine prolapse. Personally, I do not remember to have ever seen a case in which I felt confident that a retroversion was due to laceration of the perineum; and I am certain that I have never seen a case in which the repair of a lacerated perineum has resulted in a cure of a retroversion or seriously prolapsed uterus, excepting in case of procedentia, and then the relief has usually been but temporary, a more thoroughgoing operation being required. Indeed, I have frequently been struck by the fact that the uterus and ovaries, and other pelvic viscera, were all in perfect position, notwithstanding the patient under examination was found to be suffering from a slight laceration of the perineum.

It has always appeared to me very remarkable that if the perineum plays so absolute a rôle in the support of the pelvic viscera as has been supposed, we should so often find cases of complete procedentia without any serious laceration of the perineum. I have seen a good many cases of complete laceration of the perineum; and yet, strange as it may appear, I have not in a single one of these cases found procedentia, nor any condition even approaching complete prolapse. I am convinced that we have had exaggerated views upon some of these questions, and it appears to me that we have been working at the wrong end of the problem. The careful study which I have given this subject during the last ten or twelve years has firmly established me in the opinion that displacements of the uterus and ovaries rarely, if ever, depend upon weakness or deficiency of the perineum. I have undertaken to show, in various papers published during the last eight years, —

1. That displacement of the pelvic viscera is not, as a rule, an isolated pathological condition, but is associated with similar static disturbances of the viscera of the abdominal cavity; and,—

2. That the principal causes of uterine and ovarian displacements are such as affect the static relations of the viscera of the abdomen as well as those of the pelvis; and hence the rational treatment of pelvic displacements requires the removal of all causes of displacement of the abdominal as well as of the pelvic viscera, and the restoration of the normal support of these organs.

A careful analysis of the symptoms manifested in several thousand cases of women presenting distinct evidences of pelvic disease, has convinced me that a large share of the nervous and other functional disorders from which these patients suffer is due, not so much to the pelvic disorders themselves, especially in cases of displacement of the pelvic viscera, as to the condition of general visceral prolapse involving nearly all the organs of the lower half of the trunk.

Most women suffering from pelvic diseases complain of pain when on the feet, dragging pain in the bowels and the lower part of the back, pain at the extreme lower end of the spine, soreness and pain in the region of the navel, a feeling of lack of support in the lower abdomen, a

sensation commonly described as goneness at the pit of the stomach, weakness of the lower limbs, pain in the back, crawling, tingling, numbness, stinging and other sensations in the legs, cold hands and feet, burning of the soles and palms. Sometimes the patient says that, when on her feet, she is only comfortable when holding up the bowels with the hands. Such patients tenaciously cling to the corset, because they evidently need some support. They often complain that when they undertake to stand without a corset there is such a sinking at the stomach that they are compelled to sit down. The evident cause is the dragging of the prolapsed bowels and stomach, occasioned by the relaxation of the abdominal muscles by which the branches of the pneumogastric and sympathetic nerves are put under an unnatural strain. It is evident that in these cases a large part of the symptoms are due, not to the pelvic disorder, but to the general disease of which this is a part.

If we expect to cure a woman who is a chronic sufferer from pelvic disorders, we must treat the patient rather than the malady. This is a principle which applies, in fact, to most chronic disorders; and a failure to recognize this principle is the rock upon which professional effort often splits. It is as hopeless to undertake to cure such maladies by the usual routine methods, which are addressed to local symptoms and conditions only, as to expect to kill a noxious weed by picking off its flowers or a few of its leaves. The whole disease must be eradicated, root and branch. This can only be accomplished by the removal of the morbid conditions which are the real cause of the multitudinous symptoms by which the disorder is recognized and for which it is often named.

Rational treatment of this class of diseases must include, first of all, the adoption of a proper dress, which is one in which every muscle in the trunk can have perfect freedom to act. The patient must be instructed to have her dress measure taken with the chest fully expanded, and to allow an inch or two for growth, in the hope that she may to some degree overcome the deformed condition induced by ignorant obedience to fashion, rather than to the laws of physiology and the dictates of common sense.

Shoulder braces and harnesses of every description are, on the whole, a snare and a delusion. The only correct principle is to suspend everything from the shoulders by means of a waist, which will equally distribute the weight upon natural bearings, and at the same time give latitude for the greatest freedom of waist movement.

If all women would at once adopt a healthful mode of dress, probably half of our profession would be obliged to seek some other calling. Certainly at the present time, more than half our business consists in efforts to repair damages which women have ignorantly inflicted upon themselves. Neither a proper knowledge of the requirements of the body, nor a just consideration of the principles of beauty justifies the popular mode of dress. The idea that a small waist or a round waist is beautiful is a mischievous and dangerous notion, which ought to be eradicated from the public mind.

For twenty years I have made constant use of gymnastics in the treatment of this class of disorders. On beginning a course of exercises, the first thing requisite on the part of the patient is a suitable dress. The ordinary fashionable dress is absolutely unfit for this purpose. Indeed, it is dangerous for a woman to undertake a gymnastic exercise or any considerable degree of exercise of any sort, in a dress which constricts the waist. When the abdominal organs are forced down by waist constriction, any exercise which brings into powerful action the diaphragm or abdominal muscles has the effect to force the depressed organs still farther downward, and thus the mischief produced by improper dress is greatly aggravated. No constriction about the waist whatever should be allowed. Even a gymnastic dress is sometimes made harmful by the tightness of the bands. My instruction to ladies for the fitting of a dress at the waist is to have the measurements taken during a deep abdominal inspiration, and then add two or three inches so as to allow room for development.

At first the exercise employed must be very light,— barely enough to produce gentle fatigue. Some soreness of the muscles will always be experienced if the amount of exercise taken is sufficient to accomplish any good.

The exercises which I have employed are, in general, light calisthenics, consist-

than four hundred per cent. In one instance the percentage of increase was nearly five hundred.

It is, of course, essential in carrying out a system of treatment of this kind that the physician should have at command thoroughly trained assistants, who can execute, or assist the patient to execute, a prescription for exercise as accurately as an experienced pharmacist prepares a medical prescription. I am sure, however, as must be conceded by any one who has given the matter careful thought, or at least by one who has observed the result of methodical treatment of this sort, that a rational treatment of pelvic diseases in women must include systematic exercises such as those which have been briefly outlined. By means of such exercise the abdominal muscles are strengthened so that they may be able to hold the abdominal viscera in their proper place. The weakened respiratory muscles are developed, and the artificial mode of breathing corrected, so that the respiratory process gives to the abdominal and the pelvic circulation the natural and needed assistance, thus relieving pelvic congestions. I have often been astonished at the rapidity with which pelvic congestions, ovarian and uterine irritability and hyperesthesias, and cervical and vaginal catarrhs disappeared under the influence of normal respiration and increased strength of the abdominal muscles. General nervous irritability, spinal hyperesthesia, and general debility quickly yield in the majority of cases to a judicious system of exercise combined with other rational measures, although previously refractory to the most carefully prepared medical prescriptions, rest-cure, and various plans of management.

It is, of course, necessary to select carefully the cases to be subjected to this kind of treatment, and to begin the treatment in a most judicious manner. Cases of pyosalpinx, or active ovaritis, or salpingo-ovaritis, or any condition of the pelvic organs in which there is an active inflammatory process going on, as indicated by local pain, heat, tenderness, throbbing, and a general rise of temperature, are not, of course, fit subjects for treatment by exercise.

The value of hydrotherapeutics, at least in the form of the vaginal douche, is now well understood by the profession, although I fear not as thoroughly utilized as it ought to be. But there are other measures of treatment the value of which are fully as great as that of the vaginal douche, especially the sitz bath, the wet girdle, or *umschlag* of the Germans, and the cool spray or shower bath. The sedative effect of the sitz bath, and the powerful tonic effect of cool applications to the surface of the body, are of the highest value.

Abdominal massage is almost indispensable in the treatment of these cases. Its purposes are: —

1. To relieve the strain upon the abdominal sympathetic by replacement of the bowels, stomach, and other displaced viscera.

2. To relieve the obstinate constipation which exists in a large proportion of these cases, and which contributes materially to the toxemia which is the existing cause of the attacks.

3. To aid stomach, intestinal, and liver digestion.

The procedures employed by the writer in abdominal massage are the following:—

"1. Preliminary movements — deep breathing, inspiratory lifting, lifting the abdominal contents.

"2. Reflex stroking.

"3. Nerve compression.

"4. Vibration — deep vibration, lateral shaking, circular shaking.

"5. Percussion — tapping, spatting, hacking, beating, clapping.

"6. Deep kneading — digital kneading of the colon; kneading of the colon with the fist; kneading of the colon with the fingers and heel of the hand; kneading of the colon with the thumb.

"7. Mass kneading of the abdominal contents.

"8. Rolling.

"9. Fulling (carefully).

"10. Petrissage, or muscle kneading.

"11. Stroking.

"12. Percussion of lumbar spine and sacrum.

"13. Hips-raising and knees-separating exercises."

Pelvic massage is also of unquestioned value in the treatment of a large variety of pelvic disorders, although it has little value unless employed in connection with abdominal massage, and is of no permanent efficiency unless supplemented by such exercise as will strengthen the abdominal muscles and the muscles of the trunk in general.

(To be continued.)

# TRANSLATIONS AND ABSTRACTS

[THE articles in this department are prepared expressly for this journal.]

## SOME PEDIATRICAL DON'TS.

SOME pediatrical don'ts of great value are given by Dr. W. A. Newman Dorland in *Medical Progress*. Among them are the following: —

Don't fall into the habit of ascribing the mother's fears and anxieties to a hysterical tendency which it is your duty to ignore. Listen to her, and profit by her suggestions.

Don't indulge in any sudden or violent movements while examining infants. Undue fright will thus be avoided.

Don't forget that the respiratory sounds, especially the inspiratory, are normally full and harsh in childhood. Hence the term "puerile" respiration.

Don't make a diagnosis of pulmonary cavity from the presence of the "cracked-pot sound" in children. This sound may be elicited in pleurisy and pneumonia as well.

Don't forget that tubercular disease of the peritoneum and mesenteric glands is a frequent occurrence in early childhood, and is usually indicated by great prominence of the abdomen.

Don't forget that the liver is relatively large in young children, and prominent below the ribs, even when there is no diseased condition present.

Don't diagnose the presence of intestinal parasites until one or more of the worms have been seen.

Don't fail to administer a purge of castor-oil on the first appearance of greenish-colored stools, especially if the season be hot and sultry.

Don't fail to suspect the onset of some grave disorder — scarlatina, pneumonia, or meningitis— when there is persistent vomiting.

Don't permit a woman suffering from grave constitutional disease — tuberculosis or syphilis— to nurse her child.

Don't permit a woman who has again become pregnant to continue nursing her infant.

Don't wean a child until after the twelfth month, if possible to avoid it.

Don't permit a child to nurse from the breast after the eighteenth month.

Don't wean a child during the summer season, unless absolutely unavoidable.

Don't give a baby which must be raised artificially, food preparations containing starch or its derivatives, glucose and dextrin.

Don't be alarmed at the great rapidity of the pulse. Any undue excitement or prolonged crying, or even a slight febrile excitation will give rise to a pulse out of all proportion to the gravity of the general condition. A rapid pulse during sleep, however, is of more grave significance.

Don't designate the symptoms of rheumatism by the popular term "growing pains." Serious heart disease in its earliest stage may thus be overlooked.

Don't forget that tubercular meningitis is usually preceded for weeks or months by a gradual but progressive loss of flesh.

Don't mistake the relatively greater development of the head in proportion to the shoulders for a commencing hydrocephalus. It is the natural condition in the early weeks of infancy.

Don't forget that the pain of incipient coxalgia is first complained of usually in the knee of the affected side.

Don't mistake the normal breath sounds which are heard in auscultating the fontanelles for the bruit which may be indicative of the onset of disease,— hydrocephalus or rickets.

Don't forget that inability to speak or to walk, and other evidences of backwardness in children, may be due to some form of mental disorder, either idiocy or imbecility.

Don't forget to examine the urine frequently throughout the stadium of scarlet fever. Nephritis is a common sequel to this disease, and its onset must be watched with jealous care.

Don't vaccinate an infant while it is suffering from eczema or tooth-rash.

Don't order large amounts of medicine. One or two ounces of a preparation will generally suffice.

Don't fail to remember that success in pediatrical practise necessarily depends largely upon acuteness of observation.

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**Typhoid Fever from Oysters.**— The *Medical Week* for June 5 publishes the following abstract of a paper by Dr. Chantemesse, read before the Academy of Medicine, June 2, 1896: —

"I wish to call attention to a case

which proves that typhoid fever may be transmitted by oysters.

"In a small city of Hérault, Saint-André-de-Sangonis, in which there had been no case of typhoid fever for about a year, a merchant received on February 15 last a basket of oysters from Cette. These oysters were sold, and eaten raw by fourteen persons in the city, all of whom fell ill; whereas, those of the members of the six families in which these oysters had been consumed, who had not eaten any oysters, experienced no discomfort of any kind. Of the fourteen persons who fell ill, eight developed comparatively slight symptoms, such as gastric pain, vomiting, diarrhea, general malaise, etc.; in four others the stools were offensive and dysenteric in appearance. The last two, a girl of twenty and a young man of twenty-one, developed an exceptionally severe form of typhoid fever, and the former died.

"Having heard of this case, I bought from one of the principal oyster-dealers in Paris fresh oysters of various brands, ready to be delivered for consumption, all of them being alive and in good condition. On subjecting them to bacteriological examination, I found that every one of them contained a large number of germs, and in many the bacillus coli was present. Some of these living oysters were placed in sea-water which had purposely been infected with dejecta of typhoid-fever patients, and the bacilli of this disease. After twenty-four hours had elapsed, they were taken out of the water and kept for another twenty-four hours, representing the time usually required for the transport of these mollusks from the banks to the place of consumption. The oysters were then still alive, with no special odor and of good appearance.

"Bacteriological examination showed that the bodies of the animals and the water in which they had been kept, contained living coli bacilli and Eberth's bacillus, the epidemiological phenomena being thus confirmed by bacteriological evidence.

"The oysters probably become infected in the fattening ponds or reserves, which are usually situated on the seashore, near the mouths of rivers and canals, which convey microbes and dejecta of all kinds.

"Similar cases have been reported from other countries, in England by Cameron and Broadbent and in America by Conn, etc. In the latter country, cases of transmission of infectious diseases by oysters have become so numerous as to lead to a government inquiry on the subject."

The writer recommends government supervision of the fattening farms and reserves, suggesting that if contamination of these establishments cannot be prevented, then the oysters, before being forwarded to market, "might be shipped to the wild coasts of Belle Island and Brittany," to enable them to get rid of their impurities.

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**Boiled Milk.**— Practical and every-day experience shows that when milk is boiled it is not only more easily digested, but that it has a nutritive value quite equal to the raw article. Experiments undertaken by Dr. C. Chamouin (*Canadian Lancet*), first with kittens and afterward with infants, showed after exhaustive and repeated trials that the kittens fed on boiled milk were "twice again as fat" as those supplied with the raw milk, and that the boiling of milk is the means of preventing the loss of innumerable lives by gastro-intestinal disease. Not only so, but it is more easily digested, and agrees with a far greater percentage of cases than unboiled milk.

There is ample authority for this view of the case, but certain points must be attended to, else the results will not be so favorable. First, all the vessels in which the milk is carried, boiled, and afterward kept, must be scrupulously clean. Nothing less than absolute freedom from dirt will suffice. Then the milk should never be boiled in an open vessel, but should have a close cover. Lastly, it need not be kept at 212° F. for more than twenty minutes. This is sufficient to sterilize and cook it, and no further boiling is necessary.

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**Blood Lavage in Surgical Infections.**— P. Walton (*Belg. Med.*, July 16) reviews this question. Dastre and Loye have shown that intravenous injection of salt solution, amounting even to two thirds of the animal's weight, may be made without accident, provided the entry be slow and well regulated; at 0.7

per cent., or even 1.0 per cent., there is no toxic dose, but merely a toxic speed of introduction. Lejars, in a period of five days, injected 26 liters in a septicemic patient without any grave results. Michaux injects doses of 1000, 1500, and 2500 gr. a day. Péan, as well as Walton, regards these as maximum doses, to be reached without serious risks. Péan recommends subcutaneous injections in preference to intravenous. By these injections arterial tension is restored to normal, with frequency of heart beat lessened, and diuresis increased. Colson reports the following case: Male, aged 28, with articular abscess of right knee, temperature 40.7° C., tongue dry, delirium constant. Free incision, drainage and daily sublimate irrigations, a purgative, alcohol, quinine. After two days the temperature, which had fallen to 38.6°, rose to 40.2° C., tongue dry, pulse 130, skin dry and burning, urine scarcely a pint daily. Subcutaneous injection of one liter of 0.7 per cent. salt solution was followed two hours later by abundant urine. The next day the disquieting condition returned. Fresh injection of one liter was made, resulting in renewed improvement of symptoms. The injection was repeated for five days, and recovery ensued.

**A Case of Antitoxin Poisoning.**— Krückmann (*Therap. Monatschrifte*, June, 1896) had this experience: While injecting Behring's antitoxin solution No. 2, the patient coughed in his face; he therefore injected a Koch's syringeful into his own left arm. He records his symptoms as follows: Half an hour later he was seized with violent stabbing pains in the head and a pricking sensation all down the back; in another half-hour he had developed giddiness, ringing in the ears, precordial pain, and extreme prostration, so that he was hardly able to undress and go to bed; temperature was 106° F. The arm became swollen, with loss of power in the digital extensors; the skin became dry and purplish red, and ears much swollen; the pulse was imperceptible; great thirst; and an extreme sense of oppression occurred in the abdomen, which was slightly relieved by frequent vomiting and defecation; both vomit and stools were small in amount. There was much fear of impending death; eventually a profuse diaphoresis came on, followed by peaceful sleep, nine hours after the injection. Next day he was almost well; some dark urine was passed twenty-four hours after the injection. No albumin was present. Some swelling of the lower lip, with pain and redness of the tip of the tongue, took place a day later, but these soon passed away, and in three days convalescence was complete. The patient whom he was attending, although only half the author's weight, and having received twelve times as much serum, made an uninterrupted recovery.

**Roentgen Rays the Cause of Dermatitis and Alopecia.** — Maracuse (*Deut. Med. Woch.*, July 23, 1896) relates the case of a young man aged seventeen, on whom experiments were made with the rays once or twice each day for a period of four weeks. The sittings were from five to ten minutes each, but longer when the chest was being illuminated. During these experiments the body was clothed. The tube was never placed nearer than 25 cm. from the body; at first, a slight diffuse redness, with some desquamation, was noticed on one half the face, more marked above the ear. The investigations were continued, and it was observed that there was a sharply defined patch above the ear, where the hair was very thin, and could be easily plucked out and without pain. In the back there was a large area over which the epidermis was completely separated. On the chest there was a similar area. The dermatitis resembled that caused by burns.

**Implantation of the Urethra.**— Sig. Burri, an Italian surgeon, reports the successful implantation of the urethra into the intestine. His first experiments were made upon dogs, but he has recently carried out the operation successfully upon human beings. In performing the operation, the urethra was first freed for a sufficient portion of its length, and the freed portion wound around a small bobbin or button to which it was slightly fastened by a silk suture. A small slit was then made in the intestine, the bobbin slipped through, and the slit sewed up. The bobbin was passed from one to two weeks after the operation.

**Hydrotherapy.** — Von Vogl (*Münch. Med. Woch.*, July 7, 1896) lays stress on the importance of instruction in this branch of treatment. He further states that hydrotherapy is of great value in the prevention of tuberculosis. It improves cardiac action, deepens breathing, and increases nutrition. It is also useful in both the early and advanced stages of pulmonary tuberculosis. The fever and cough are lessened by it, and the sleep and appetite improved. The acute infectious fevers may be treated by this means with great benefit to the patient. The author draws attention to the lessened mortality of typhoid fever since the use of the graduated bath has been introduced; he also calls attention to the comparative uselessness of medicinal antipyretics, intestinal antiseptics, etc. The bath treatment is harmless and effective in skilful hands. The proper administration, however, requires both theoretical knowledge and practical experience.

**A Method of Detecting the Local Excretion of Sugar in the Organs.** — Seelig has lately introduced (*Archio. f. Experiment Pathologie and Pharmacie*) a method for detecting and fixing sugar in the organs, in the very place of its excretion. Diabetes having been produced experimentally, in rabbits, by the administration of phloridzin, Seelig applies the phenyl-hydrazin test to the tissues themselves. A small portion of tissue is placed for fifteen minutes in a watery solution of phenyl-hydrazin and glacial acetic acid, previously warmed in a water-bath. It is then washed in water acidified with weak acetic acid, hardened in a ten-per-cent. formal solution, frozen, and cut into sections. These sections, in the case of the kidney, showed the characteristic yellow needles, indicating the presence of sugar, chiefly in the interstitial spaces between the uriniferous tubules. Seelig believes that his observations show that in glycosuria the sugar can be fixed where it is excreted just as can the albumin in albuminuria.

**The Cause of Addison's Disease.** — Since this malady was first clearly defined as a pathological entity, its cause has continued a mystery, but the problem of its causation seems to have been recently solved by a discovery made at the Pathological Institute of Berlin; viz., that a brown coloring matter known as pyrocatechin, or brenzcatechin, is secreted or formed by the suprarenal capsules. Its production is confined to the medullary substance of the glands. This peculiar substance quickly turns brown by contact with the air, which explains the brown pigment present in Addison's disease. Investigation of its properties shows the pyrocatechin to be a poison, which leads to the natural conclusion that it may be responsible, not only for the pigmentation present in Addison's disease, but for the other symptoms characteristic of this malady.

**The Radical Cure of Hernia in Children.** — Dr. Broca, of Paris, (*Lyons Medical Journal*) reports having performed the radical operation for the relief of hernia in children under fifteen years of age in four hundred and fifty cases. Only one death occurred in this series of cases, and that was due to septic peritonitis.

**Iodoformin.** — Professor Von Kölliker recommends a new preparation derived from iodoform and peraldehide, and known as iodoformin, as a substitute for iodoform. It is odorless; it can be sterilized by heat, and does not produce eczema from irritation of the tissues.

**Cure for Chilblains.** — Apply oil of eucalyptus, painting it on with a camel's-hair brush. It relieves the pain, and effects a cure in a very short time.

**Massage in the Treatment of Muscular Rheumatism.** — Graham (*Am. Journal Med. Sciences*, Vol. CVI, No. 2) points out that lumbago may arise from cold, strain, fatigue, or rheumatism. Its pathology is probably coagulation of the semi-fluid contractile muscular substance, and adhesion of muscular fibrils, so that motion gives rise to partial, irregular, and painful contractions. Recent cases of muscular rheumatism are almost invariably cured by massage. The author further states that the same result may be brought about, though not so rapidly, by rest, warmth, electricity, or the use of

salicylate of soda. Five different actions are claimed for massage by the author; namely, mechanical, thermal, electrical, nervous, and chemical, and suggests that when a case of apparent muscular rheumatism not only does not yield but does not remain improved after massage, the probability is that the case is one of neuritis, affecting the nerve fibers that supply the impaired muscles. This probability will be strengthened if the pain is uniform, affecting the same muscles on both sides; if it is worse at night, when at rest and warm in bed, and better when up and moving about. In the case of muscular rheumatism it would be aggravated by motion, and relieved by rest and warmth. Massage may thus be used as a means of diagnosis between muscular rheumatism and neuritis.

**Oxygen Combined with Anesthetics.**— The advantages of using anesthetics combined with oxygen gas are summed up in the following statements by Dr. J. D. Hart, of Brooklyn, in the *Journal of the American Medical Association*, June 20, 1896:—

1. There is seldom or never any period of excitement during the early administration of the anesthetic.

2. There is no nausea, vomiting, or cyanosis at any time while the anesthetic is being given, either in the early stage or during the operation, except in cases where brandy has been given before or during the operation.

3. The patients are more readily restored to consciousness, and make a more rapid recovery.

4. A much smaller amount of the anesthetic is required, usually only about one third the usual quantity, and seldom more than three and one-half ounces of ether per hour, and the same proportion of chloroform or A. C. E. mixture.

**Cure of Tubercular Peritonitis by Laparotomy.**— Gatti (*La Presse Medicale*, May, 1896) has been making some extended experiments upon guinea-pigs, dogs, and rabbits, for the purpose of determining the manner in which laparotomy cures peritonitis. He finds laparotomy of no service in these cases, at the beginning of the infection. Within about a month after the operation, the tubercles begin to diminish in size, and finally completely disappear. He attributes the disappearance of the tubercles to the bactericide action of a serous fluid which appears in the peritoneal cavity after the operation.

**Hereditary Tuberculosis.**— Can a child be born with tuberculosis as the result of direct transfer of the bacilli from the mother to the fetus? Bologuesi (*Thèse de Doct.*), after examining the placenta from thirteen tubercular women, and in several cases the organs of the fetus, for tubercle bacilli, concludes that the inheritance of tuberculosis is usually only a disposition, though the direct transfer does occasionally occur. The conditions which favor direct transfer are: First, a miliary tuberculosis of the mother, with tubercle bacilli in the blood; second, a placental tuberculosis, which has produced such lesions that the passage of the bacilli is no longer prevented; third, amniotic fluid containing bacilli, which can thus be swallowed by the fetus.

**Acoustic Gymnastics.**— The auditory nerves of people who have been born deaf are, in many cases, susceptible to a considerable degree of training. The exercise is begun by indicating to the patient certain vowels to be used. After several minutes' use of these vowels, called into the ear in a steady, loud voice, the patient often arrives at a differentiation of sound. Gradually the other vowels should be employed. Let this exercise be graded carefully, increasing the distance between teacher and scholar as rapidly as the latter can bear it.

At first the lessons must be very short (not more than ten minutes), and repeated two or three times each day; for the undeveloped power of hearing is very soon tired. Age seems to offer no obstacle to the success of this method, and very beneficial results are seen from it in cases of either congenital or acquired deafness.

**Iodine in the Thyroid Gland.**— E. Baumann has recently shown that the thyroid gland contains iodine. His experiments led him to suspect that in diseased conditions this gland contains less iodine than in a normal state.

**Massage in the Treatment of Joint Fractures.**— Our attention is drawn by Pello (*Archio. di Ortoped*, Aug. 13, farc 3, 1896) to the value of early massage and passive movements in cases of intra-articular fracture. He considers that the treatment by prolonged fixation delays recovery, and often leads to ankylosis. In those cases in which light massage was begun immediately after the fracture, the pain was greatly lessened. By increasing the amount of massage, and by diminishing the rigidity of the bandage daily, complete recoveries were made in each case, in a remarkably short time.

**Cold Baths in Delirium Tremens.** — M. Letulle (*La Presse Medicale*, 1896), after discussing the therapeutic value of the various drugs employed in delirium tremens, recognizes as the most efficient remedy complete immersion of the body in water of a temperature of 64.4° F. The head of the patient is at the same time kept cool by suitable applications. The bath is continued for eight to fifteen minutes, and should be repeated every two or three hours. Thus administered, it is highly sedative.

**Relation of Ovaries to Sex.**— Seligson states that if the right ovary is removed from a rabbit, the animal bears afterward only female young, while if the left ovary is removed, the animal bears only male young. In nineteen cases of tubal pregnancy, the fetus, when found upon the right side, was a male, when upon the left side, always a female.

**Infiltration Method of Anesthesia.** — The infiltration method of anesthesia, devised by Schleich, seems to have acquired a definite place in surgery. The amount of cocain, morphia, or codein is so small that 40 or 50 c. cm. of the solution may be used without running the risk of toxic effects. The solution must be aseptic and cold. Amputations of the forearm and other operations involving considerable time and extent of tissue, have been performed successfully by this method, which Schleich has used in over three thousand cases.

**Function of the Suprarenal Capsule.** —Dr. Charrin has recently reported to the Biological Society of Paris some observations made by Dr. Pettit which go to confirm what has previously been believed — that at least one of the functions of suprarenal capsules is the destruction of poisons, especially those produced by microbes.

**Oxygen after Ether.**— After the use of ether as an anesthetic, Dr. Landau (*Medical and Surgical Reporter*, July 4, 1896), of Berlin, has his patients inhale pure oxygen. As a result of this procedure, the dusky hue of the face disappears, the pulse becomes fuller and slower, and there is a more rapid recovery of consciousness. With the rarest exceptions, the patients do not suffer from the vomiting which is so distressing and dangerous an accompaniment of ether inhalation, and the pain is also greatly diminished.

**Length of the Small Intestine.**— Dr. Byron Robinson, on measuring the small intestine in eighty-seven males and twenty-six females, found its average length in the male to be five feet and three inches more than that of the average female. The longest small intestine observed in the male was thirty-three feet; the shortest, twelve feet and six inches. In the females the longest intestine was twenty-nine feet, and the shortest, eleven feet. The average for males was twenty-three feet and three inches; for females, eighteen feet.

**Typhoid Antitoxin.** — Beumer and Peiper (*British Medical Journal*) have recently reported experiments which show that immunity against typhoid fever may be established in guinea-pigs by a method analogous to that pursued in relation to diphtheria. It has not yet been applied to human beings.

**To Preserve Surgical Instruments from Rust.**— Marshall recommends dipping instruments, after cleansing, in a twenty per cent. solution of bicarbonate of soda and alcohol. It is stated that steel, iron, and copper instruments may be kept bright in this way.

# BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE AND BACTERIOLOGICAL REVIEW, from original sources.]

**The Microbes of the Human Skin.** — Dr. Paul Remlinger (*Medicine Moderne*) states that besides the varied saphrophytes, there are to be found on the skin numerous pathogenic micro-organisms, as staphylococci, streptococci, bacilli coli, etc.

Staphylococci are said to be the cause of many dermatoses, such as impetigo, ecthyma, boils, some folliculites, etc.

Dr. Remlinger suggests the probability of the numerous saphrophytes harbored by the skin as acting in a mechanical way, and thus preventing the perfect performance of the cutaneous functions.

Dr. Remlinger made experiments on fifty soldiers who were convalescing from non-cutaneous diseases. These patients, who had not been bathed for a given length of time, were ordered to take baths by immersion. The quantity of water put into the tubs was measured exactly, and the patients ordered to scrub vigorously every portion of their body. The lowest figure obtained for the number of microbes left in the bath was 85,000,000; the highest number was 1,212,000,000; the average number was 550,000,000. Generally speaking, the number of microbes was in direct proportion to the number of days the patient had been without bathing.

**The Xerosis Bacillus.**— J. Eyre (*Jom. Path. and Bach.*, 1096, iv, No. 1, pp. 54-63) gives the chief cultural and morphological points of distinction between the xerosis bacillus and the diphtheria bacillus as follows:—

1. After inoculation from the secretion upon blood serum, colonies of the xerosis bacillus do not open under thirty-six hours, while those of the diphtheria bacillus appear in sixteen to eighteen hours.

2. When grown on neutral bouillon or milk, the xerosis bacillus never gives rise to an acid reaction, while the diphtheria bacillus invariably does so.

3. When grown upon potato, the xerosis bacillus rapidly degenerates and dies, while the diphtheria bacillus grows with more vigor and to a greater size than on any other medium.

4. When grown upon ten per cent. gelatin, colonies of xerosis bacillus are not visible to the naked eye under forty-eight hours, while the diphtheria bacillus colonies can be recognized in twelve to fourteen hours.

5. The nature of the bouillon cultures of the xerosis bacillus is invariably innocuous when inoculated into the subcutaneous tissues of animals susceptible to the diphtheria bacillus.

As to the exact value of the xerosis bacillus, whether it be a non-virulent and slightly altered species of the diphtheria bacillus, or a totally separate and distinct bacillus, it is impossible to decide.

**Löffler's Bacillus and Diphtheria.** — Hennig, of Königsberg (*Charlotte*, N. C., *Med. Journal*, August, 1896) gives the results of an exact clinical and bacteriological examination of sixty-three cases in relation to Löffler's bacillus, as follows: Löffler's bacillus was found in thirty-five cases; in only some of these was the disease clinically true diphtheria; in others it was follicular sore throat or tonsillitis, and one was a case of pharyngitis apthora. In seven cases which later exhibited paralysis the bacillus was not found.

Hennig concludes from this that this microbe cannot be invariably the determining agent in Bretoneau's diphtheria, and that no treatment based on the hypothesis that it is so can be accepted as specific. He further states that the results from serumtherapy are by no means as brilliant as they seem; that many writers had obtained better results before antitoxin came into use, having cured all but three or four per cent. of their cases, including gangrenous and scarlatina cases. Hennig recommends the use of lime-water, and the permanent application of an ice cravat, etc.

**Celluloid as a Substitute for Plaster of Paris.**— Londerer and Kirsch (*Centralbl. für Chir.*, No. 29, 1896) find that celluloid chipped fine and dissolved in acetone (one part celluloid and four parts acetone by volume) makes an excellent substitute for plaster of Paris in ban-

dages and jackets. The solution is made in a close-stoppered bottle, and is frequently stirred to assist in the process. Gauze or crinoline bandages are used after each layer of bandage is applied; some of the celluloid is rubbed thoroughly into it, the hand being protected by an ordinary kid glove. From four to ten layers are applied and rubbed full of the celluloid mixture, according to the strength desired. This form of jacket weighs about one fourth as much as one of plaster of Paris; it is very elastic, is easily kept clean, and is impervious to moisture.

**A New and Easy Method of Preparing Serum Agar-Agar.**— Dr. A. A. Kanthack (*Lancet*) gives the following method of preparing serum agar-agar from ascitic, pleuritic, or hydrocele fluids. To every 100 c. cm. of serous exudation add 2 c. cm. of a ten-per-cent. solution of caustic potash; this converts the serum albumin into an alkali albumin, which is not precipitated on boiling. To this add 1.5 to two per cent. of agar-agar, previously soaked in acidulated water, and boil the mixture in a Koch's steamer until the agar-agar is well dissolved. It must now be filtered through a hot water-funnel. The filtrate should be perfectly clear. To the filtrate add four or five per cent. of glycerine. It may then be poured into test tubes and sterilized. Besides the glycerine, 0.5 to two per cent. of grape sugar may be added; this however generally renders the medium a little darker in color.

Before adding the caustic potash to the serous fluid, a small quantity of it should be boiled in a test tube. If it becomes practically solid, or contains large quantities of albumin, the fluid must be diluted with at least twice its bulk of distilled water; and then to every 100 c. cm. of the diluted fluid 2 c. cm. of KOH and 1.5 to two grams of agar-agar are to be added. The serous exudation, after the addition of the alkali, also forms a good liquid nutrient medium for bacteria.

**Tuberculosis of Human Beings and of Fowls Identical.**— The experiments of MM. Gilbert and Roger, recently published, show conclusively that the tuberculosis of human beings and of birds is one and the same disease. Observations made by Cadiot and Strauss also confirm this fact.

**Persistence of the Löffler Bacillus in the Mucus of the Nasal Passages.** — L'Gendre and Pochon (*Wiener Klin. Rundschau* X, No. 19) observed a child in whom the Löffler bacilli, at first virulent, later much less virulent, have persisted for fifteen months after diphtheria in the nasal mucous membrane. Repeated washings of the nasal and pharyngeal cavities with a five per cent. Labarraque's solution caused a temporary disappearance of the bacilli; but as soon as the irrigation was given up, the child became sickly again, lost its appetite, and the cultures from the nasal mucous membrane again showed the bacilli.

**Germs in Breast Milk.**— Writing in *Pediatrics*, Dr. Jacobi calls attention to the fact that breast milk frequently contains germs. He says: —

"M. Cohn and H. Neumann found germs in the healthy breast milk, even after the mammæ and nipples had been washed with alcohol and with solutions of corrosive sublimate. A. Palleske met with the staphylococcus pyogenes albus in one half of all healthy women; F. Honigmann in most of them; and H. Knochenstein in the mammæ of eight puerperal and nursing women. Evidently they had immigrated from outside; they proved innocuous. But who can doubt that, if the epithelium of the milk ducts had been morbid, there would have been a chance for mastitis, or if the staphylococcic milk had got into contact with a sour stomach or intestine, there would have been an opportunity for gastritis or enteritis."

**The Transmission of Tuberculosis by a Brass Horn.**— Dr. Addison S. Thayer, in the *Journal of Medicine and Science*, reports the cases of three young men who became infected with tuberculosis through the medium of a second-hand horn hired from a dealer. The three users of the horn in question were the only members of the band who did use it. These three patients are at the present time undergoing climatic treatment for tuberculosis.

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## WHERE TO SPEND THE WINTER.

THIS is a question which many invalids are just now asking themselves, and in regard to which not a few physicians are being solicited for advice. It is coming to be the fashion with an increasing number of people to flee to some more genial clime on the first approach of cold weather in the Northern States. The first snowflakes have already fallen, and the prospect is that we shall have an earlier and a longer winter than usual, which will doubtless lead to the exodus of many thousands of invalids and semi-invalids from the Northern States to the South and other warmer regions.

The South affords many excellent invalid resorts. The mistake that invalids make in going south is in not going far enough south. If one undertakes to escape the cold Northern winter, he should take care to escape it altogether, for the reason that he makes no preparation for it. Those who remain North put on, as the cold weather approaches, the winter constitution which prepares them to resist the cold; and it is undeniable that there is so great an advantage in this constitutional change that it is a misfortune to lose it, if one is sufficiently vigorous to react to the stimulation of cold air, which is really one of the finest of all nature's tonics. The dense, pure air of the winter months is an inestimable blessing to those who are prepared to utilize it; but there is a multitude of persons, even in the Northern States, as well as other parts of the country, belonging to an unenviable class who might properly be termed the *morituri*; they have so little vital resistance that they are ready to die on almost no provocation. The flickering flame of life may be snuffed out by the cold blasts of the North; the brittle thread may be broken by the little extra strain resulting from a hard cold. Such persons, like wax figures, must be carefully protected from atmospheric changes. Having been treated all their lives like hothouse plants, they cannot endure wintry blasts or sudden changes of temperature. There are numerous places in the South which afford a haven for such persons during the winter months; and if they do not return too early in the spring, many may, by this annual migration, lengthen out their lives, who would be liable to succumb to pneumonia or a sharp attack of bronchitis before getting through the first month of a severe Northern winter.

There are other regions of country, as well as the South, which afford a safe haven for this class of invalids and valetudinarians. We are inclined to the opinion that too little attention has been given to the advantages of some portions of the Rocky Mountain region as a winter resort. Having enjoyed the pleasure of making several visits to Colorado and adjacent portions of the Rocky Mountain district during the winter months, we have become convinced both from our own experience and what we have learned from persons resident in that region, that for the great majority of invalids, Colorado presents unrivaled advantages as a winter resort, one of which is its almost perpetual sunshine. The vivifying, vitalizing influence of sunshine is undeniable; and a climate in which, as in Colorado, the invalid can be out of doors at least ninety-five days out of a hundred, enjoying the full benefit of uninterrupted sunshine accompanied by a

constant, invigorating breeze, must be recognized as possessing superior advantages for a large class of invalids.

Great benefit must also be derived by the chronic invalid from the high altitude and the crisp, dry air of the Rocky Mountain region. The increased diaphragmatic action, the accelerated heart activity, and the stimulating effects of a dry air upon the skin, necessarily result in a favorable modification of all the vital functions of the body, which is of the highest importance in all forms of chronic disease. The consumptive whose case is hopeless in other parts of the United States, recovers in this region, not because of any specific influence of the Colorado climate upon the bacillus tuberculosis, but because of the increased activity of the tissues and the heightened resistance of the body. The vital status of the invalid becomes so raised that he is able to cope successfully with the invading microbes, and thus in the battle between the body and the germs, the system gains the victory. It thus appears that the same conditions which render Colorado so valuable as a resort for consumptives, make it equally advantageous as a climate for chronic invalids of other classes, especially as a winter resort.

The great difficulty heretofore encountered in going to Colorado has been that invalids were wholly at the mercy of the hotels and boarding-houses, which are not usually prepared to supply the invalid with the various comforts so necessary to all persons in feeble health. This want, however, has at last been supplied. A well-equipped sanitarium has been established at Boulder, where invalids will find not only every possible comfort and convenience, but the added advantage of skilled and experienced physicians and all modern facilities for baths, massage, Swedish movements, electric-light baths, and other medical and hygienic agencies.

Those who care to go so far from home will also find Guadalajara, Mexico, a delightful spot, where, at the same altitude as Denver, or more than five thousand feet above the level of the sea, perpetual summer reigns. The same management which has been instrumental in developing the institution at Battle Creek, Mich., and that at Boulder, Colo., is erecting a sanitarium at Guadalajara, which will be completed within a few months. The institution is already in operation, the work at present being carried on in hired buildings which are very conveniently situated for the purpose.

Residents of the Northern States who go south to winter, and select locations having the same altitude as those in which they have lived in the North, simply secure the advantage of a prolonged summer. Upon returning to their homes in the spring, they continue under the relaxing, and, to some degree, debilitating, influence of warm weather. There being no change in altitude, there is practically no change in climate, and they lose the advantage of change of season, which is really equivalent to a climatic change. Thus those resident in the temperate zones, by a change to a more elevated region instead of going to a warmer climate and a low altitude, may obtain the advantage of climatic change without suffering the exposure to cold weather. It is true that the Rocky Mountain region is not entirely exempt from cold weather; once or twice during the winter season the thermometer runs down to zero or even below, and occasionally there is quite a fall of snow, but in two or three days the sun shines, the snow disappears, and summer weather reigns again for several weeks.

Those who may be interested in going to the Rocky Mountains for the winter will do well to investigate the merits of the Boulder region, for which purpose the Boulder Sanitarium will be glad to furnish a supply of interesting literature.

Those contemplating a visit to Mexico during the winter should not fail to visit

the quaint old city of Guadalajara, one of the most interesting cities of the republic. Mr. D. T. Jones, who has charge of the sanitarium there, will take pleasure in supplying any information which may be desired.

## WERTHEIM'S METHOD OF RESTORING RETRO-DEVIATIONS OF THE UTERUS.

A WRITER in the *Journal of the American Medical Association* recently describes, under the above title, a new method of the operation of shortening the round ligaments. By this method the peritoneal cavity is opened from the vaginal surface, the uterus is pulled down, and the ligaments are doubled upon themselves and sewed together. It is stated that by this method the ligaments can be shortened from six to nine centimeters (from two and one-half to three and one-half inches). This operation was first performed by Wertheim in January, 1896, and described in the *Centralblatt für Gynäkologie* in February, since which time it has been performed about twenty-five times, and, it is claimed, with good results. The advantages claimed for it, over the so-called Alexander-Adams method, are: —

"1. It leaves no visible scar.

"2. The operation is easier to perform, the ligaments being larger at this point.

"3. The transverse cut in the vagina, sewed vertically, assists in anteverting the uterus.

"4. It allows perfect access to the pelvic viscera, thus permitting of minor repairing at the same sitting, when indicated.

"5. The operation is less dangerous."

Whatever the advantages of this operation may be over the Alexander-Adams operation, as first described by these operators, it certainly does not possess the advantages claimed, over the method of shortening the round ligaments which has been perfected in this country, and is now employed by a number of first-class operators. We will notice each one of the advantages claimed, contrasting them with the method of shortening the round ligaments by external incision: —

1. As regards the production of external scars: This is a matter of very small consequence, and amounts to nothing when it is understood that the operation of shortening the round ligaments may be performed by an incision not more than half an inch in length, in any ordinary subject, and the incision is made below the upper border of the area naturally covered by hair, so that it is completely concealed. Moreover, as the wound always heals by immediate union when the operation is properly performed, the scar, at the most, is merely a faint white line, and, in some cases, even this disappears.

2. The operation of shortening the round ligaments, when properly performed, secures the ligament at a point just below its exit from the internal ring, where it is always large enough to be found easily, if one knows where to look for it. Some little dexterity is required for picking up the round ligament quickly, but it is no more difficult to find than to find one of the muscles of the eye in performing an operation for strabismus, provided the operation is done in a similar manner, which is the proper method. The writer has rarely occupied more than seven or eight minutes in performing this operation on both sides, and has frequently completed the operation for both sides in five minutes. It certainly will not be possible for the most skillful operator to perform the operation by Wertheim's method in anything like so short a time.

3. The transverse cut in the vagina sewed vertically will assist in anteverting the uterus only when the uterus is included in the closing sutures. It has been clearly shown that anterior vaginal fixation, as well as ventro-fixation, is

highly conducive to the occurrence of complications in childbirth requiring operative interference.

4. If there is necessity for examining the pelvic viscera, it is much better to make a ventral incision so that a more thorough examination can be made and the diseased parts removed, if required. "Minor repairs" can be much more easily made through a ventral opening than through a vaginal incision.

5. We are amazed at the claim that Wertheim's operation, as described, is less dangerous than the operation of shortening the round ligaments. It is possible that the operation of shortening the round ligaments might be performed in such a careless or bungling manner that a patient's life would be jeopardized, but after performing the operation in nearly five hundred cases, the writer is justified in saying that the operation of shortening the round ligaments by external incision is free from danger, if performed in a skilful and aseptic manner. All of our cases have made excellent recoveries, and none have at any time been in a condition even suggesting a fatal result.

We see no advantage whatever in this new method of shortening the round ligaments. The operation must be much more difficult and more hazardous, as well as much less thoroughgoing and successful than the operation of shortening the round ligaments which the author has several times described, and which has proved successful in other hands as well as his own.

There are three decided objections which may be urged against Wertheim's method, besides those which have been already mentioned, any one of which is sufficient to condemn it: —

1. The operation does not admit of sufficient shortening of the ligaments; a shortening of from two and one-half to three and one-half inches is rarely sufficient to do the patient any good. The uterus should be drawn as far forward as possible, which requires a shortening of the ligaments to the amount of from four to seven inches; from five to six inches is, in our experience, the average amount required.

2. The method of shortening the ligament by folding it upon itself and introducing sutures, first suggested by Dr. Dudley, of New York, has long ago proved to be inefficient. The coapted peritoneal surfaces, if they become adherent by inflammation, may separate later, through absorption. If this result occurs, the ligament is certain to return, sooner or later, to its original length, through the stretching of the peritoneum, a structure which has great capacity for extension, as we have often seen in the bands, and as is frequently shown by the great length of bands often encountered in operations for the removal of abdominal tumors.

3. It is impossible to lift the uterus sufficiently far forward by this operation to accomplish any satisfactory results. This is clearly shown by the author's cut

Position of the Uterus after Wertheim's Operation of Shortening the Ligaments.

showing the position of the uterus when the operation is completed, and which is herewith reproduced. The uterus, as here shown, is beyond the first degree of retroversion. The pouch in front of it will certainly be filled with small intestines,

which will gradually force the uterus down into its former position. The operation of shortening the round ligaments does no good unless the uterus is drawn forward sufficiently to lie well against the bladder, so that the intestines lie wholly behind it. We quite agree with Dr. Alexander, that the reason why physicians are dissatisfied with the method of operation with which his name is connected, is, that "they do not get the knack of doing it." Dr. Alexander originally performed the operation by cutting down upon the external ring. This operation is very difficult in women who have small round ligaments, which is the case with most of our American women.

Seven or eight years ago the writer published his method of cutting down upon the internal ring, and drawing the ligament up with a hook passed through a small opening in the roof of the canal and braiding the loop of the ligament into the tendon of the external oblique, fastening it in place by two closing sutures of silkworm gut passed through all the tissues of the ligament itself at several points. We have performed the operation by this method in nearly five hundred cases, and with most satisfactory results in ninety-five per cent. of the cases. Pregnancy has occurred in a considerable number of these cases, and with no unfavorable results which could be in any way attributed to the operation.

It is interesting to note the fact that some new surgical method of curing retro-deviation of the uterus is being continually brought forward. This fact is sufficient evidence that the method of ventro-fixation, which certainly is sufficiently easy of performance, is not satisfactory, further evidence of which is afforded by Miländer's report (*Zeitschrift für Geburtshülfe und Gynäkologie*, Bd XXXII, Hft. 3), which shows that in fifty-four cases of labor at full term, after ventro-fixation, eleven required operative interference, as follows: Four delivered by forceps; four by turning; one by extraction; and two by Cæsarian section.

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**Toxicity of the Gastric Juice in Epileptics.**—Since the publication of Bouchard's memorable work, "Les Auto-Intoxications," many investigations have been made which point very strongly toward the toxic origin of epileptic paroxysms, at least in cases of idiopathic epilepsy. Numerous examinations of urine have been made in epileptics, with the result that a high toxicity has been found. In one case investigated by the writer, the toxicity of the urine of a patient just recovering from a succession of epileptic paroxysms was found to be more than double the normal; the animal injected with it died in most powerful epileptic form convulsions.

Augustini has recently investigated the toxicity of the gastric juice in a case of epilepsy. He found that the gastric juice of the epileptic, when injected into the abdomen of a rabbit, proved fatal, with general toxic symptoms and chronic convulsions. This was found to be especially true when the gastric juice was obtained immediately before or after an attack. Normal gastric juice was found to produce no such evil effects. Augustini concludes from these experiments that systematic lavage, or washing of the stomach, and disinfection of the intestines by an aseptic dietary and other appropriate measures, are indicated in all cases of epilepsy.

These observations agree entirely with the clinical observations made many years ago, and specialists in this class of disorders have long taught that abstinence from flesh-eating was essential in the treatment of epilepsy. Bouchard showed that the toxicity of the intestinal contents is doubled when meat enters largely into the dietary. By withholding flesh food, and confining the patient to a diet of fruits, grains, and other vegetable

products, with a moderate allowance of milk, the alimentary canal may be rendered comparatively free from germs and the toxins which are the result of bacterial growth.

These facts carry with them the suggestion that the septic condition of the alimentary canal resulting from the use of flesh food may be responsible for many other nervous disorders besides epilepsy, and that a vegetarian regimen, as ordered by the late Professor Dujardin-Beaumetz, of Paris, may be advantageously adopted in a large class of chronic disorders.

**The Pan-American Medical Congress.**— Through the enterprising efforts of Dr. Reed, of Cincinnati, Dr. Montgomery, of Chicago, and others, very excellent arrangements have been perfected for the Pan-American Medical Congress to be held in the City of Mexico next month; and no doubt a large number of eminent American physicians will make the journey to the capital city of our neighbor republic. A splendid program has been provided, and there is every reason to believe that our Mexican neighbors will give their confreres of the United States a most liberal and cordial reception. On the occasion of the meeting of the American Public Health Association in the City of Mexico a few years ago, the American members were greatly surprised to meet a number of distinguished Mexican physicians at the border, who had been sent as delegates to pilot them from the United States to their headquarters in the City of Mexico. President Diaz had not forgotten to show especial courtesy to the visiting members by instructing the Custom House officers to make no inspection of their baggage.

Those who desire information respecting transportation, etc., should address L. H. Montgomery, M. D., Central Music Hall, Chicago, Ill.

# REVIEWS.

A STUDY OF THE OPERATIVE TREATMENT FOR LOSS OF NERVE SUBSTANCE IN PERIPHERAL NERVES. — By G. Carl Huber, M. D., assistant professor of histology and embryology in the University of Michigan. Ginn &. Co., Boston.

This paper is a most exhaustive study of these subjects, to which the author has devoted many months of painstaking research. Dr. Huber has rendered great service to reparative surgery in demonstrating the feasibility of restorative operations upon injured nerves and other bodily structures. Briefly stated, the general conclusions of his research are as follows: —

1. That it is possible to restore the functions of a divided nerve by introducing a segment taken from some other nerve trunk, and suturing the ends.

2. The segment introduced acts only as a guide to the down-growing axis cylinders. The axis cylinders of the implanted segment disappear by degeneration, leaving empty the sheath of Schwann.

3. This grafting may be employed either as a primary or a secondary operation.

4. The results from an implanted segment are better than from a union, by flaps, of the divided nerve.

5. It is not possible to obtain regeneration of the peripheral part of the divided nerve by connecting it with an uninjured nerve trunk.

The work is illustrated by several beautiful lithographs, which were executed in Frankfort especially for this work, and are of great service in making clear the interesting facts presented in the text.

CHRONOLOGICAL NOTES ON THE VISITATIONS OF THE PLAGUE IN LANCASHIRE AND CHESHIRE. — By William E. A. Axon, Manchester, England. Published by Richard Gill, Tib Lane, Cross Street, London.

This little pamphlet is a model of careful historical research. A brief account is given of every outbreak of plague in these counties between the years 1349 and 1665. Of the earliest part of this period, the author says: "Hecker regards 1347—50 as the period of the Black Death, and estimates that the number of deaths in Europe from it was twenty-five million. The moral effects of the Black Death were notable. Fear killed many whom the disease might have spared. Evil-doers were seized with repentance, or at least with dread."

It is stated that about one third of all the inhabitants died at this visitation, and others that followed were scarcely less fatal in their results. The work is chiefly made up of extracts from the records of the times, which are of great interest on account

of the quaint, old-fashioned language employed, and the incidental insight into the inside of the social and domestic life of those times, as well as for the medical and statistical information afforded. Mr. Axon has enjoyed unusual facilities for the work which he has undertaken, through the opportunities afforded him for a wide acquaintance with the early English literature while acting for many years as librarian of the Manchester city library.

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THE ETIOLOGY AND PATHOLOGY OF GASTRITIS, UPON WHICH IS BASED RATIONAL THERAPEUTICS. — By Fenton B. Turck, M. D., Chicago, Ill.

Dr. Turck's name has become well known through his elaborate investigation of the pathology of gastritis. The aim of this paper is to present the practical methods of dealing with this disease. The author takes the position that the chief cause of gastro-intestinal disorders is "errors of diet." He denounces cheese and sausage because of the saprophytic germs which these unwholesome foods contain. He denounces pepper, mustard, and spices as powerful gastric irritants, together with alcoholic drinks and beverages containing acids, salts, tartrates, lactates, etc. Sherry wine, champagne, beer, and port wine are shown to be injurious, not only on account of the alcohol which they contain, and which the author insists is deleterious in any form, but because of the yeast germs, acids, and salts which are found in them. Hasty eating, which is encouraged by the lunch-counter and the railroad restaurant, the author declares to be "a menace to public health." Dr. Turck declares that "New England has furnished a race of dyspeptics through the baked pork and beans, hot biscuit, doughnuts, and mince-pies, washed down with ice-water, which go to make up the New England dinner, and which prepare the way for the ravages of the 'bacillus gastricus.'"

The author cites a number of cases illustrative of his conclusions and his methods, which, for the most part, must be commended as eminently rational. One of the most important of these is the hot bath, starting at a temperature of 100° F., and running up to from 105° to 115° F., the bath to be followed, when the surface has become reddened, by a rubbing of the skin with ice. We think a caution should be uttered with reference to this bath, which is one of the most vigorous, we might say violent, of therapeutic measures. First, a temperature of 115° F. is a little too high. Few patients can endure this temperature unless they have been gradually worked up to it through a series of baths, and no particular advantage is gained by so great heat. A temperature of 120° is positively dangerous to life, and even 115° approaches rather too near the danger point. Good results can be obtained by a temperature of from 105° to 108.° We have found a cold spray or a needle bath quite as effective as rubbing the surface with ice; it is, indeed, more effective, for the reason that the application being made upon the whole surface at once, a stronger impression is produced.

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REPORT OF THE COMMITTEE ON HEALTH RESORTS. — An extract from Vol. XI of the Transactions of the American Climatological Association.

This little paper contains a large amount of excellent information concerning health resorts in various States. On glancing through the report, however, it is impossible to avoid the impression that a considerable amount of partiality has been shown, since some very well-known resorts, such as Clifton Springs, N. Y., and others equally well known, are not even mentioned. It is especially surprising that the State of Michigan, with its long list of splendid summer resorts, well adapted to nearly all classes of invalids, including those who are suffering from hay fever, for the relief of which Petoskey, Mackinac Island, and Traverse City are almost world-famous, is not even mentioned. Wisconsin, with its numerous very delightful lake-side resorts, is also wholly ignored. Jacksonville and St. Augustine are not noticed among Florida resorts, although mention is made of Winter Park, in Tampa. Asheville and Aikin, N. C., are overlooked, though some smaller and less important places are mentioned. Information concerning these places is readily accessible, and we cannot understand what motive has prompted the committee to omit them from a report which, if complete and impartial, would be of great value to the profession.

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TRANSACTIONS OF THE AMERICAN MICROSCOPICAL SOCIETY. — This is a report of the eighteenth annual meeting of this excellent society which has done so much valuable scientific work. The volume is fully equal to any of its predecessors, and contains a great amount of exceedingly valuable matter, histological and biological, as well as microscopical. The plates with which the book is illustrated are excellent. The secretary, Dr. W. C. Krauss, Buffalo, N. Y., certainly deserves much credit for the great amount of labor which he has devoted to this report, and for the admirable form in which it appears.

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APPLICATION OF THE GALVANO-CAUTERY IN THE NASAL PASSAGES. — By J. W. Gleitsmann, M. D., New York.

In this paper the author defends the use of the galvano-cautery and snare in the removal of turbinated hypertrophies and similar growths in the nose. He recommends the application of trichloracetic acid after the application of the cautery.

# The Battle Creek Sanitarium
# LABORATORY OF HYGIENE.

J. H. KELLOGG, M. D., Superintendent.
GEO. H. HEALD, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
A. B. OLSEN, B. S., M. D., Pathologist.
W. A. GEORGE, M. D., Chemist.

**Monthly Résumé of Work Done.**

## REPORT OF EXAMINATION OF BLOOD.

FOR SEPTEMBER.

| Blood Count. | Men. | Women. | Total. |
|---|---|---|---|
| Over 5,000,000 | 3 | | 3 |
| Between 4,500,000 and 5,000,000 | 61 | 18 | 79 |
| " 4,000,000 " 4,500,000 | 11 | 39 | 50 |
| " 3,500,000 " 4,000,000 | 5 | 6 | 11 |
| " 3,000,000 " 3,500,000 | 2 | 3 | 5 |
| " 2,500,000 " 3,000,000 | 2 | | 2 |
| Totals | 84 | 66 | 150 |

| Hemoglobin. | Men. | Women. | Total. |
|---|---|---|---|
| 100 per cent. | 46 | 34 | 80 |
| 93 " " | 27 | 20 | 47 |
| 85 " " | 7 | 10 | 17 |
| 79 " " | 1 | 1 | 2 |
| 64 " " | 2 | 1 | 3 |
| 57 " " | 1 | 0 | 1 |
| Totals | 84 | 66 | 150 |

**Gastric Laboratory Report for September.**— Regular analyses, 140; experimental, 20; total, 160. The regular cases were from the following States and countries: Michigan, 35; Illinois, 29; Indiana, 13; Ohio, 10; Iowa, 7; Minnesota, 6; Wisconsin, 5; Pennsylvania, 4; Missouri, 4; Tennessee, 3; Canada, 3; Massachusetts, 3; South Dakota, 3; Texas, 2; Kansas, 1; New York, 1; South Carolina, 1; Arkansas, 1; North Carolina, 1; West Virginia, 1; Mississippi, 1; Florida, 1; North Dakota, 1; Alabama, 1; Virginia, 1; Louisiana, 1; Australia, 1. Total, 140.

**Sputum Examinations for September.**— There were 33 examinations made, 22 of which were new cases. Tubercle bacilli were found in 8 cases, 7 of which were new.

**Urinary Laboratory Report for September.**— Number of specimens examined, 322; number of cases, 217. Number of cases in which albumin was found, 33; casts, 6; pus, 52; blood, 14; sugar, 3; bile, 6. Number of specimens tested for toxicity, 12; number of cases tested for toxicity, 12.

**We should be glad to have you write for a sample of**

# TAKA-DIASTASE.

**Acts more vigorously on starch than does Pepsin on Proteids.**

## RELIEVES

# Starch Dyspepsia

We are now able to relieve a large number of persons suffering from faulty digestion of starch, and can aid our patients, during convalescence, so that they speedily regain their weight and strength by the ingestion of large quantities of the heretofore indigestible, but nevertheless very necessary, starchy foods. We trust that the readers of the *Gazette* will at once give this interesting ferment a thorough trial, administering it in the dose of from 1 to 5 grains, which is best given in powder, or, if the patient objects to the powder, in capsule.— *The Therapeutic Gazette.*

**Pepsin is of no Value** **In ailments arising from** **Faulty Digestion of Starch.**

## PARKE, DAVIS & CO.,

**BRANCHES:**
NEW YORK: 90 Maiden Lane.
KANSAS CITY: 1005 Broadway.
BALTIMORE: 8 South Howard St.
NEW ORLEANS: Tchoupitoulas and Gravier Sts.

**BRANCH LABORATORIES:**
LONDON, Eng., and WALKERVILLE, Ont.

**Manufacturing Chemists,**

**DETROIT, MICH.**

# PUBLISHERS' DEPARTMENT.

A FOOD CURE FOR INDIGESTION.— Physicians are all the time looking for remedies for indigestion. Every general practitioner has under his care a larger or smaller number of patients who are a constant source of annoyance and distress to him, because of the obstinacy of their digestive disorders. Hydrochloric acid, pepsin, pancreatin, malt, all sorts of "stomach tonics," digestants, peptones, peptonoids, etc., have been tried, and often with apparent temporary relief; but sooner or later the chronic sufferer gets back into the old ruts and declares that nothing helps him. The dietary has been revised again and again. He has been recommended to try the milk diet and the meat diet; and perhaps, in utter disgust and despair, the patient has at last decided that no diet will agree with him, and that it makes no difference what he eats; and so the doctor has finally repeated to his patient the advice of the late Dr. Austin Flint, who said to his patients suffering from indigestion, when their impatient, almost discouraged questions, "What shall I eat?" "How much shall I eat?" and "When shall I eat?" came pouring in upon him, "Eat what you like, eat as much as you like, and eat when you are hungry."

This great confusion respecting the treatment and dietetic management of persons suffering from disordered digestion has arisen from a lack of suitable means for making a thoroughly scientific study of this large class of disorders. The recent advances in physiological chemistry and in methods of investigating disorders of digestion have put the profession in possession of data whereby most of the mystery has been cleared up. We are now able to study the work of the stomach, the products of the work, and the stomach itself — its position, its dimensions, etc.— with the same degree of accuracy with which the eyes, nose, throat, and other organs have heretofore been studied. The rapid advancement which these improved methods of diagnosis have enabled us to make within the last few years has at last delivered the whole subject of the treatment of this class of maladies from the rut of empiricism, and placed it upon a scientific basis.

One of the most interesting and practical results obtained through these modern researches is the discovery of the fact that the administration of digestive ferments and the various so-called "stomach tonics" is practically useless, and that digestive disorders must be almost altogether managed, and may be most successfully treated, by the exact adaptation of diet to the various conditions which are revealed by an accurate investigation of the organ and its functions; in other words, the profession are discovering that materia alimentaria is a matter of immensely greater importance than materia medica in the management of disorders of digestion.

An evidence of progress in this direction is to be found in the growing demand for graham flour, whole-wheat flours, cracked wheat, pearled wheat, rolled wheat, and similar preparations. All of these preparations, however, possess certain disadvantages. Most of them are open to the criticism that the bran, or outer covering of the wheat, is presented in the form of large, sharp flakes, which are quite incapable of digestion, and are likely to irritate a sensitive stomach, or to accumulate in the dependent portions of prolapsed and dilated stomachs. Those who have had a large experience in the employment of lavage are familiar with the fac that not infrequently a considerable amount of rubbish of this sort is removed twenty-four or even forty-eight hours after it has been swallowed.

A vast number of new food preparations of various sorts have within the last few years been placed upon the market. Unfortunately a large share of these preparations are the product of commercial interest and enterprise solely, whatever virtue they possess being derived from the brilliant and alluring descriptions in the advertising matter prepared to amuse the reader, rather than from any intrinsic merit of the foods.

Another objection to the use of these preparations of wheat has been the fact that they are usually presented in the form of mush or other soft preparations, which, when eaten, do not call forth the activity of the salivary glands, so that food requiring the presence of a large amount of starch-digesting saliva is swallowed with the admixture of only a very small amount of this important digestive agent. It may be added, also, that in a great majority of farinaceous preparations, whether made from wheat or from other grains, the starch is imperfectly cooked. This imperfect cooking has been encouraged by the fictitious claims made by many manufacturers of cereal products to the effect that their particular products are already cooked by steam or otherwise, and can be prepared for use in ten to fifteen minutes, or even a shorter time. Experience has shown that farinaceous foods, especially whole-wheat preparations, require very long cooking, from three to five hours being none too long for ordinary whole-meal foods. Experiments in our schools of scientific cookery have also developed the fact that grain preparations are improved by a second cooking.

Careful investigations of the chemistry of digestion have shown that the inability to digest starch is an exceedingly prevalent condition among dyspeptics; hence there has been a growing demand for a food or foods which should combine the element of palatableness with the two essential qualities,— dryness, necessitating mastication, and thorough cooking, securing easy and complete digestion. The food which has heretofore most nearly met the required conditions has been zwieback, or twice-baked bread, made famous by its large employment at Carlsbad, the world-renowned resort for disordered stomachs. But zwieback is by no means altogether palatable, and does not agree with many delicate stomachs because of the long time required for the solution of the flinty masses, which often resist the most patient and vigorous efforts at mastication.

A few of the new food preparations, however, are the product of long and patient scientific inquiry, instituted for the purpose of meeting a patent need. One of these is a most unique food to which the inventor has given the name "Granose," in which are to be found all the elements of palatableness, dryness, and thorough cooking, reaching even to the stage of heat digestion by the conversion of starch into dextrin, thus securing an abundant flow of saliva through the necessity of thorough mastication, and ready digestibility in the stomach as the result of complete disintegration.

Granose consists of the entire wheat, spread out by means of powerful machinery working under immense pressure, into thin, translucent, almost transparent flakes, which are baked in an oven

until slightly brown. When placed in the mouth, these flakes are found to have a delicate, tasty flavor, and a delicious crispness which yields very quickly to the pressure of the teeth, reducing the flakes almost instantly to fine particles. These particles are at once moistened by an abundant flow of saliva, which, by contact with the dry flakes, is made to pour out into the mouth from the salivary glands. Experiments have shown that the salivary glands are stimulated to greater activity by the element of dryness in the food than by any other means.

To chew a bit of zwieback or a hard cracker for a length of time sufficient to reduce it to a pulpy or pasty condition, is a task which a person may, by degrees, be trained to accomplish from a sense of duty or a dread of dire consequences, but can never be said to afford any real pleasure or satisfaction. The delicate crispness of granose, however, affords that same sort of gustatory satisfaction to the eater which so often leads one to delight his palate with tart pie-crust or Saratoga chips at the risk of a sleepless night or a bilious attack next day. To chew zwieback, bread-crust, or hard-tack, is to do penance. Granose affords real gustatory satisfaction, thus combining profit with pleasure, and preparing the way for good digestion.

Granose has already proved a boon to thousands of weak stomachs. Within a few months the demand for this new product has grown, by the mere force of its intrinsic merit, from a few hundred pounds weekly, to several tons, and is now being shipped by the carload to New York, Boston, and other great centers. It is unquestionably the most perfect of all cereal foods, and when employed as the chief element of diet, may be relied upon to cure most forms of indigestion. Biliousness, "heartburn," sour stomach, constipation, gastric catarrh, and a great variety of other functional disorders of the stomach, yield under this diet. It is just the thing for a person suffering from dilatation or prolapse of the stomach. It is equally useful in both hypopepsia, and hyperpepsia, and is, in fact, as near a dietetic panacea as is likely ever to be produced. It should be used as a substitute for all other kinds of bread. It may be had either in the form of flakes, or lightly pressed into cakes. In either form it is universally liked, and is not only pronounced delicious at the first taste, but comes to be an absolute necessity to those who have once become acquainted with it. For circulars relating to this most valuable of all health foods, address Battle Creek Sanitarium Health Food Co., Battle Creek, Mich.

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WE announced, some time ago, as in preparation, a translation of "Traite des Maladies de L'Estomac," by Debove and Rémond, and are glad to say that the work is progressing, and we hope soon to announce it as in press. MM. Debove and Rémond have announced the publication of the book by the Modern Medicine Publishing Co., and we predict for it an extended sale. The work is one which ought to be in the hands of every one interested in the disorders of digestion.

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THE Pan-American Medical Congress, which will meet before the publication of our next issue, promises to be a great success. Our Mexican confrères have been exceedingly active in making preparations for the congress, and they are certain to do their utmost to make it a very enjoyable and profitable occasion.

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WE have recently had the pleasure of examining and testing a bicycle which has been especially designed for use by invalids. It is known as the Richmond Wheel, and possesses, as a peculiar and characteristic feature, a spring and an air-cushion in that portion of the frame which supports the seat. By this ingenious arrangement the rider is entirely relieved of the unpleasant jars and jolts to which he is subjected when riding upon the ordinary bicycle. Our experience with the Richmond has convinced us that it is vastly superior to any other wheel made, as regards ease and comfort to be experienced while riding it.

We have subjected this wheel to the most severe tests, and after riding it almost daily for a month in passing to and fro from our residence to our office, and taking occasionally a longer trip, we should consider it a hardship to be compelled to ride any other wheel. We are glad to be able to say this in the interests of those who are looking for the right wheel to recommend to invalids, and we are also glad to be able to add that what we have said in favor of the Richmond is without the knowledge of the manufacturers of the wheel, and that we receive no compensation for saying it.

# DIRECTORY OF SANITARIUMS.

THE following institutions are conducted under the same general management as the Sanitarium at Battle Creek, Mich., which has long been known as the most thoroughly equipped sanitary establishment in the United States. The same rational and physiological principles relative to the treatment of disease are recognized at these institutions as at the Battle Creek Sanitarium, and they are conducted on the same general plan. Both medical and surgical cases are received at all of them. Each one possesses special advantages due to locality or other characteristic features.

## ST. HELENA SANITARIUM, OR RURAL HEALTH RETREAT,

ST. HELENA, CAL.

W. H. MAXSON, M D., Superintendent.

IRVING E. KECK, Business Manager.

THIS institution is beautifully located at the head of the Napa Valley. It is a fine large building, with excellent appointments, and all facilities required for the treatment of chronic invalids of all classes. It has also a record for a large amount of successful surgical work. There are several able physicians connected with the institution. The scenery is delightful, the climate salubrious; the water supply, which is furnished by mountain springs, is pure and abundant. Hundreds of cases of diseases generally considered incurable have been successfully treated at this excellent institution during the twenty years of its existence.

## CHICAGO SANITARIUM,

28 COLLEGE PLACE, CHICAGO, ILL.

THIS institution is a branch of the Battle Creek (Mich.) Sanitarium. It is favorably located near Lake Michigan, in the southern portion of the city, close to Cottage Grove avenue, and facing the old Baptist University grounds. A few patients are accommodated. Facilities are afforded for hydrotherapy, and the application of massage, electricity, Swedish movements, and other rational measures of treatment.

## NEBRASKA SANITARIUM,

COLLEGE VIEW (LINCOLN), NEB.

A. R. HENRY, President.

A. N. LOPER, M. D., Superintendent.

COLLEGE VIEW is a thriving village located in the suburbs of Lincoln, with which it is connected by an electric railway. College View is the seat of Union College, one of the leading educational institutions of the West. The Sanitarium has a beautiful location, facing the spacious college grounds, and gives its guests the advantages of a quiet, homelike place, combined with appropriate and thoroughly rational treatment. It has a full equipment of excellent nurses, and has already won for itself an enviable reputation in the West.

## PORTLAND SANITARIUM,

PORTLAND, ORE.

L. J. BELKNAP, M. D., Superintendent.

THIS institution is beautifully located in the center of the city, in a fine building with spacious grounds; and although it has been in operation scarcely more than a year, it already has a good patronage, and has evidently entered upon a successful career. Facilities are provided for the dietetic and medical treatment of chronic ailments of all kinds. The advantages for treatment include, in addition to various forms of hydrotherapy, electric-light baths, and apparatus for the application of electricity in its various useful forms, manual Swedish movements and massage.

## COLORADO SANITARIUM,

BOULDER, COLO.

W. H. RILEY, M. D., Superintendent.

THIS institution is located on a beautiful site of one hundred acres, including a fine mountain peak, and commanding extensive landscape views which, for variety and beauty, can hardly be equaled. The site adjoins the thriving city of Boulder, and is about one hour's ride by rail from Denver, the streets and principal buildings of which are easily discernible from the peaks around Boulder. The equipment consists of a large building especially erected for the purpose, two fine cottages, and every appliance for the application of hydrotherapy, and for the special treatment of pulmonary ailments, to be found in the best establishments of like character. Particular attention is given to the dietetic treatment of patients, and to systematic exercise, in addition to the special treatment for specific ailments. The altitude is between five and six thousand

# Directory of Sanitariums.—Continued.

feet, just that which has been determined to be the best for pulmonary troubles. Though but a few months have elapsed since the work of this institution was fairly begun, a large number of persons suffering from pulmonary tuberculosis have already been cured, and are now rejoicing in sound health. The rational hygienic treatment, with the climatic advantages, has proved effective in the cure of cases which, without the combined advantages of these superior measures, must certainly have succumbed to the disease.

## GUADALAJARA SANITARIUM,

STATE OF JALISCO, MEXICO.

D. T. JONES, Superintendent.

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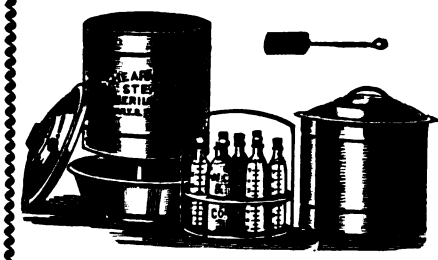

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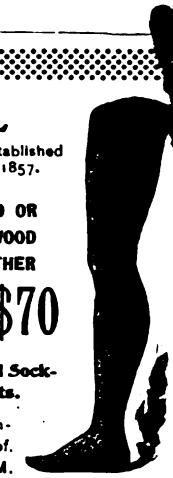

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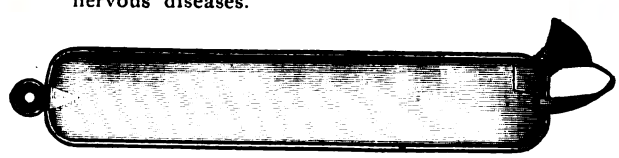

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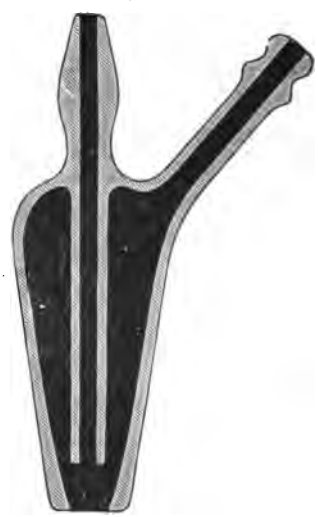

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BACTERIOLOGICAL REVIEW.

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## ORIGINAL ARTICLES.

### SCOLIOSIS AND ITS TREATMENT BY MEANS OF GYMNASTICS.

BY DR. T. J. HARTELIUS.

Translated by Dr. David Paulson.

*(Continued.)*

#### THE TREATMENT OF SIMPLE ONE-SIDED SCOLIOSIS.

HERE the fundamental principle is also simple, the indication being to restore the antagonism, or equilibrium, between the muscles of the opposite sides. The muscles upon the convex side are weakened or pathologically changed, and must be restored to a normal condition. They must be exercised, regenerated, and strengthened. If the convexity is upon the left side, as is common, bending is made toward the left, with pressure upon the highest point of the convexity, thus bringing the muscles upon the left side into activity, while those upon the right side are only passively stretched. In this way not only is the spinal column straightened, but in those cases where no special deformity or ankylosis of the vertebral bodies has taken place, the bending may exert so strong an influence upon the spinal column that the highest point of the curvature, for the time being, is changed, the highest point of convexity being transferred to the opposite side. In those cases where deformity and restrained movement of the vertebral bodies exist, the movement still shows that extension is possible. The neck-firm position increases the effect of the movement.

*Neck firm, Left-side-bending, with Support to the Left Side.*— One hand of the operator is placed upon the highest point of the convexity, the thumb upon the opposite hip. The bending is repeated gradually and vigorously several times; it may be done by one operator, yet it is of advantage to have two. The same movement may be carried out in the sitting position, or it may be performed with support against some firm apparatus to the side, toward which the bending is done.

*Right-side-lying.*— The patient lies on his side, with his legs extended upon the apparatus, the convex side upward. Bending is executed, as in the preceding case, toward the convex side. In this, as in the preceding movement, it is exclusively the muscles of the convex side which are active. The hands rest upon the hips, or, in vigorous persons, are placed neck-firm. If any marked difference exists in the position of the shoulder-blades, neck-firm is made with only one hand, that of the side on which the shoulder-blade is the lowest. This point should also be observed in connection with the preceding movement.

These two movements constitute the essential ones in the treatment of single scoliosis, and should be repeated a number of times in a given series. After some practise, these movements become easy, and are taken without any special fatigue. They may be carried out in the home, the spinal column being thereby kept in constant extension. The necessary efforts properly to develop and strengthen the weak parts should be taken in the horizontal position, alternating the movements. When the movements are made with painstaking thoroughness, a surprising effect is produced. This is explained partly by the powerful and definite action these movements have upon single curvature, and partly by the fact that this form of scoliosis generally appears in the milder types; for, if developed to any considerable degree, it is accompanied by a compensation curve, and has then passed on into double curvature.

We are not limited, however, to the above-named movements. Support-stand-

ing, right (left) arm-upward-stretching is an excellent movement, which can be taken as well as those already mentioned when the shoulders are affected by the curvature. Dissimilarity between the hips also occurs, in which case an active upward raising of the lower hip can be made: stretch-lying, left (right) hip-upward-jerking.

PRESCRIPTION I.'

1. Stoop-support-standing, arms-extending-upward with support to the left side.
2. Rest-standing, bending to the left side with support to the same side.
3. Hanging, neck-bending.
4. Right-side-lying, holding.
5. Rest-standing, raising on toes with support to the left side.
6. See No. 2.
7. Hanging, legs-parting with support to the left side.
8. See No. 4.
9. See No. 2.
10. See No. 4.

After each movement, give standing, arms-extending.

If the right shoulder, which is shorter in this form of scoliosis, is also lower, then the right hand is simply placed upon it in the rest position, and support is applied to the highest point of the convexity. All movements work together to the end that the back shall be straightened and the stretched muscles developed and strengthened.

PRESCRIPTION II.

1. Stoop-support-standing, right-arm-extending-upward with support to the right side.
2. Right-rest-right-hip-support-standing, bending to the left side with support to the same side.
3. Rest-standing, raising on toes.
4. Right-stretch-right-side-lying, holding.
5. Right-stretch-lying, pressing the left hip upward.
6. Right-rest-standing, bending to the left side with support to the same side.
7. See No. 5.
8. See No. 4.
9. See No. 2.

After each movement give standing, arm-swinging forward and upward.

Scoliotic persons suffer also from other diseases, which must receive their share of attention in treatment.

TREATMENT OF DOUBLE SCOLIOSIS.

When there is double curvature of the spine, we cannot, as in single curvature, merely straighten the spinal column by movements to the right or left; the opposite curves require movements which tend to correct both at the same time. There is effected in extension a straightening of two or more curves at the same time. If more than two curves are present, the two most prominent ones determine the movements.

*Movement.* — Neck-firm, stoop-stride-sitting, back-raising, with double side support.

The patient places his hands in the rest position, and bends forward in the sitting position. Pressure is made upon the highest point of both convexities, and then the patient rises and straightens the back under stronger resistance of the operator. Preferably, two operators work together, one being behind, the other in front of the patient.

*Movement.* — Neck-firm, support-standing, back-raising with double side support.

The patient stands with the anterior part of the thighs against some firm apparatus, and bends the trunk forward. Pressure is applied as in the preceding movement, and the patient raises himself and straightens the back under strong resistance of the operators.

These two movements, which in their effects closely resemble each other, are of great importance in double curvatures. In the second and third stages of scoliosis, where not only bending, but also rotation of the vertebræ exists, the movements must seek to correct both the curvature and the rotation. The given movements produce both these effects at the same time; for, through straightening of the curvature, the rotation passes back to its normal position.

*Movement.* — Support-standing, left (right) arm-upward-stretching, etc. There are other movements which might be utilized in the treatment of double curvature, several of which I will mention.

Forward-bending of the trunk is performed with pressure against the anterior part of the thighs with the left or the right arm; that is, the arm on the same side as the lower shoulder should be stretched upward. The simple taking of this primary position straightens the spinal

column, the effect being increased by forward stretching of the arm.

*Movement.*— Forward-lying, holding, under left (right) arm-upward-stretching. This primary position produces straightening of the back, which by having the arms stretched upward, is even more vigorously effected.

*Movement.*— Stoop-sitting, left (right) arm-upward-stretching.

This movement acts similarly to the preceding, stretching the spinal column in the uplifting of the lower shoulder-blade. These last three movements, in connection with the first, are suitable to use in those cases where one shoulder-blade hangs noticeably lower than the other.

In double scoliosis, one hip is generally lower than the other.

*Movement.*— Left (right) arm-stretch-lying.

The arm of the side the shoulder of which is lower is stretched upward.

*Movement.*— Right (left) hip-upward-jerking.

*Hanging, Knee-bending.*— The patient grasps the bar with his hands at such a distance from the floor that his feet, in the stretched position, do not reach it; or if his strength is weak, the feet may rest upon the floor, but the hands should then grasp the bar so high up that the arms and back are stretched. The patient bends the neck under resistance of the operator. This movement secures, at the same time, both passive and active stretching of the spinal column.

PRESCRIPTION III.

1. Stoop-support-standing, left-arm-extending-upward, double pressure.
2. Left-rest-stoop-support-standing, back-raising, double pressure.
3. Hanging, neck-bending, double pressure.
4. Left-rest-stoop-stride-sitting, back-raising, double pressure.
5. Hanging, legs-parting.
6. See No. 4.
7. Left-stretch-right-side-lying, stretch-holding.
8. See No. 2.
9. See No. 4.
10. See No. 7.

After each movement, give standing, arms-extending.

Some of the most efficient movements should be repeated a number of times each day, but the movements described should constitute the general plan of gymnastic treatment. The chief importance in these movements does not attach to their great variety, but to the selection of the right kind and their proper application. The right kind consists in their efficiency to stretch the muscles and develop their strength sufficiently to maintain the spinal column erect. The right application consists in this, that the movements shall be carried out with proper vigor and definiteness, as well as sufficiently often.

Does proper gymnastic treatment, with suitable movements, possess the ability to straighten the spinal column, and develop the power to maintain it in the correct position? It has been already stated that mechanical means are not as capable of sustaining the curved parts of the spinal column in position, as are suitable movements. Any one at all acquainted with gymnastic treatment will not attempt to deny the truth of this. But there is another point which is given as a reason for the use of mechanical apparatus in connection with gymnastic treatment: The continued increased pressure changes the vertebral cartilages and bodies so that they become wedge-shaped, being pointed on the concave side. This change affects first the vertebral ligaments and then the vertebral bodies. This pressure should be removed, so that it will not counteract and hinder the curative action of gymnastics. It may be necessary to wear a suitable supporting apparatus during the day; that is to say, in the erect position, to counteract the weight of the body; and in the night, when in the horizontal position, a support may be needed to counteract the tendency to retraction.

It is probable that the employment of the means above referred to rests upon good grounds. The settlement of this question, whether it shows the employment of mechanical means in scoliosis to be really needed or called for, or not, is, from a practical, and even from a theoretical standpoint, of great importance. When scoliosis is passing through different stages of development, it is of importance to know how to settle the question in each stage.

In those cases where the movement-treatment can fully remove the deformity, it is naturally unnecessary to use these adjuncts; and thus, in all those

cases where the vertebral cartilages and the vertebral bodies have not undergone any essential changes, there can be no room for doubt that the movement-treatment is the right and sure remedy. If the scoliosis is in the second or third stage, with marked deformity in the vertebral cartilages and bodies, then the movement-treatment is just as inefficient as any other means to remove the condition; but a suitable movement-treatment may, more than any other method, produce an improvement in the condition. The improvement consists in this, that the spinal column is stretched as much as possible, in order to develop the strength sufficiently to maintain it in its position. Through this development of the patient's own energies, the concavity is not only diminished, but may even be made practically unnoticeable. The spinal column, although bent, has then become so straightened and settled in position that the parts conform themselves to each other. Experience shows that persons who have had noticeable standing curvature of the spine, have, through movement-treatment, regained so vigorous a condition that they do not experience the least pain or weakness in the back. It would, without doubt, be not only unnecessary but harmful to use any supporting apparatus in these cases. Even though these appliances are ever so delicately constructed for the purpose, they are not altogether harmless. Many cannot bear them. This, however, is an inconvenience which may in many cases be overcome, and which may very often, by habit, not only come to be tolerated, but the persons be apparently benefited. Not a few assert, likewise, that the common corset, which constricts the chest, and is a hindrance to the normal activity of several important organs, is a necessary condition for health. Scoliotic persons who have gained energy to carry the spinal column without feeling pain or weakness, and can perform suitable movements, are not in need of such mechanical means, which may even prove harmful by causing the active muscular powers, which should support the spinal column, to become dependent upon these mechanical supports, and thereby become weakened.

From this it follows that the necessity for external mechanical means is limited to those cases in which, for various reasons, one cannot make use of the movement cure, or else not with sufficient energy or for an insufficient time. Many circumstances may make the movement-cure impossible; as disease in the bones, or certain diseases in other parts of the body. Financial circumstances may also place insurmountable hindrances in the way of appropriate gymnastic treatment.

(To be continued.)

## NON-SURGICAL TREATMENT OF THE PELVIC DISORDERS OF WOMEN.

BY J. H. KELLOGG, M. D.,
Battle Creek, Mich.

(*Concluded.*)

THE following is a brief outline of the method which I pursue in pelvic massage, and which I have described more at length in my work on massage[1]:—

Pelvic massage concerns the following organs: —

1. The uterus.

2. The uterine appendages — ovaries, Fallopian tubes, broad, round, and other ligaments.

3. The vagina, in cases of rectocele and cystocele.

4. The rectum, in cases of prolapsed and relaxed rectum.

5. The prostate in man; sometimes, also, the bladder, in cases in which it is atonic.

6. The coccyx, in cases of coccygodynia, in both sexes.

POSITION. — The patient lies upon the back, with the heels well drawn up, the knees separated, the hip slightly elevated, arms by the side, and the head (not the shoulders) supported by a thin pillow.

PRELIMINARY PROCEDURES. — The manipulations practised in pelvic massage are rendered very much more efficient by the application of a few preliminary movements for the purpose of placing the abdominal and pelvic contents in the most favorable condition possible in any given case. It should be remembered that in pelvic displacements there will always be found, also, displacement of the abdominal contents.

The preliminary movements which I have found the most effective, are: (1)

1 "Art of Massage," by J. H. Kellogg, M. D. Modern Medicine Publishing Co., Battle Creek, Mich.

Deep breathing; (2) Lifting abdominal contents; (3) Inspiratory lifting.

*1. Breathing Movements.*— The patient is made to execute a few full breaths in which the lower part of the chest and abdomen are well expanded with inspiration, and drawn in as far as possible with expiration.

FIG. 1.—LIFTING VISCERA.

*2. Lifting of the Viscera* (Fig. 1).— After the patient has taken three or four deep breaths, the physician stands at the patient's left, and with his back to the patient places the ulnar edge of the two hands, with the fingers extended, just over Poupart's ligament and parallel with the ligament, the fingers pointing toward the pubes. From this position the hands are moved slightly upward, the edge of the hands being made to sink as deep into the abdomen as possible without severe pain, the arms being slightly rotated at the same time, and the hands drawn upward in such a way as to grasp the contents of the abdomen and drag them upward. This movement is repeatedly executed during the act of inspiration, the patient continuing to take deep and full breaths, expanding the lower chest and abdomen as previously described. Care should be exercised to see that all displaced viscera are in perfect position.

Essentially the same movement may be executed with the patient in the knee-chest position. The masseur stands with his back to the patient's head, and reaching around the patient with one arm, drags the bowels upward during inspiration.

*3. Inspiratory Lifting* (Fig. 2).— A number of years ago, while engaged in a series of experimental studies on intra-abdominal pressure, and when one day administering pelvic massage to a patient in whom the uterine supports were greatly relaxed, I observed that with each forcible inhalation the uterus was lifted upward a distance of one-half inch or more. I noticed also that the patient was breathing almost wholly with the upper chest. In order to intensify the effect of the inspiratory lifting, I caused the patient to exhale completely, and then to make the movement of inspiration by lifting the upper chest forcibly while keeping the glottis closed, so that the air could not enter the lungs. The effect of this procedure was very remarkable, the uterus being lifted in an upward direction more than an inch at each inspiratory movement.

FIG. 2.—INSPIRATORY LIFTING OF ABDOMINAL CONTENTS.

INTERMITTENT COMPRESSION OF THE UTERUS. — The preliminary movements being completed, one, or, when possible, two fingers (index and middle fingers) of the left hand are introduced into the vagina and crowded upward behind the cervix, the uterus being first placed in perfect position, then lifted upward and forward as far as possible without giving too much pain. The extended fingers of the right hand are at the same time pressed upon the abdominal wall just above the pubes, so as to impinge upon the fundus, covering as large an area of the uterus as possible. Firm, intermittent pressure is then made, continuing for two or three seconds, with intervals of one or two seconds, this being repeated six to twelve times. In this procedure the pressure of the external hand will fall chiefly upon the top of the fundus.

When the vaginal orifice is too small to admit of two fingers, a useful application of massage may be made by the aid of one finger introduced into the vagina and another in the rectum, or even a single finger operating through the rectum.

DIGITAL KNEADING OF THE UTERUS.— The fingers of the left hand being returned to the first position behind the cervix, thus supporting the organ, the fingers of the right hand execute a circular digital kneading movement, beginning at the top of the fundus and enlarging the circle until the fingers are made to press down the sides of the uterus and all about it. A slight change in the direction of the pressure made by the fingers of the left hand enables them to antagonize constantly the movements of the right hand, so that the uterus may be by this means very thoroughly manipulated in nearly all cases, except in patients who are very fleshy. This procedure is continued from one to five minutes.

LIFTING MOVEMENTS.— The preceding manipulations will have completely freed the uterus from the overlying intestines, so that the top of the fundus will be lying in immediate contact with the peritoneal surface of the anterior wall of the abdomen. By the combined action of the internal and external hands the uterus can now be freely lifted forward, so that its form may be clearly outlined by the fingers of the right hand. The action should be intermittent.

VIBRATION OF THE UTERUS. — While supporting the organ with the fingers of the left hand behind the crevix, the thumb or one or more fingers of the right hand is applied to the top of the uterus, and fine vibratory movements are communicated to it. This is a powerful means of stimulating the uterine circulation.

DIGITAL KNEADING OF THE APPENDAGES.— In pelvic massage the manipulation should not be confined to the uterus alone. The ovaries, tubes, and the broad and round ligaments may be masséed thus: After lifting the uterus well forward, freeing it from the overlying intestines, the fingers of the left hand are directed toward an ovary. Starting as low down as possible, firm pressure is made in an upward direction, while the fingers of the external hand are made to co-operate in an effort to grasp beneath the ovary and tube and lift them forward. At the same time, gentle digital kneading movements are executed, the pressure of the external (right) hand being directed toward the fingers placed internally.

DIGITAL KNEADING OF THE ROUND LIGAMENTS.— The fingers in the vagina should be directed toward the inguinal canal, while digital massage is executed by the fingers of the right hand traveling in a curved line from the external ring along the side of Poupart's ligament and toward the fundus. The internal fingers will, to some extent, follow the movements of the right hand so as to compress the tissues between the fingers of the two hands.

STRETCHING OF ADHESIONS AND KNEADING OF EXUDATES.— When adhesions and exudates are present, firm pressure should be made directly upon the bands of adhesion or the masses of exudate with the tips of the fingers which operate internally, counter-pressure being made externally; and, as far as possible, the morbid parts should be grasped between the fingers of the two hands, and thus subjected to digital massage. Adhesions are also stretched by the lifting movements of the uterus previously described.

NERVE COMPRESSION.— The sacral plexus of the spinal nerves and several of the lowermost pairs of ganglia of the sympathetic are accessible to digital pressure through the vagina; and in appropriate cases these, as well as other nerve structures, may be stimulated by gentle compression in connection with other

procedures. One of the largest nerve masses accessible to compression through the vagina is the hypogastric plexus, which is located on the anterior surface of the sacrum, just below the promontory. A row of four or five sympathetic ganglia lies on either side of the median line just over the junction of the sacrum and ilium, the anterior aspect of the sacro-iliac synchondrosis. A single ganglion (coccygeal ganglion, or *ganglion impar*) lies in front of the coccyx. Pressure made upon these points stimulates the ganglia and their branches, and by this means excites the circulation in the pelvic vessels.

MASSAGE OF THE ABDOMINAL MUSCLES. — After the internal manipulation, the muscles of the lower abdomen and inner thighs should be gently masséed. The procedures most useful are the following, employed in the order named: Tapping, hacking, spatting, centripetal friction, and finally, stroking.

FINISHING MOVEMENTS.—

1. Knees separating, breathing. The patient should inspire while separating the knees, and expire while closing them. The vigor of the exercise may be increased by making a slight resistance to the movements of both adduction and abduction. The movements should be made at the rate of ten or twelve per minute.

2. Hips raising, breathing in as the hips rise, and breathing out as they sink. This movement should be repeated from four to eight times. The movements of knees separating, hips raising, and breathing may be executed simultaneously.

3. The treatment should be concluded by having the patient turn upon the face and administering percussion — tapping, hacking, spatting, beating, and clapping over the sacrum and fleshy portions of the hips.

The following points should be carefully observed in the administration of pelvic massage: —

1. Never administer pelvic massage to erotic patients, nor in cases of vaginismus, acute pyosalpinx, pelvic abscess, growing tumors of the uterus or ovaries, rectal ulcer, acute vaginitis, irritable urethra, or inflammation of Skene's glands, until after these conditions have been removed. The best results are obtained in cases of subinvolution of the uterus, relaxed ligaments, recent exudates, and passive congestions with little sensitiveness. Kesch recommends that uterine massage should be applied especially during menstruation, but does not give what seems to the writer to be valid reasons for the recommendation. My opinion is very positive that massage should be discontinued during this period.

2. Before treatment have the patient thoroughly empty the bladder and bowels, employing an enema, if necessary, or a coloclyster (large enema in right Sims's or in knee-chest position). A hot vaginal douche should also be administered.

3. No movements should be made with the hand used internally except with the ends of the fingers.

4. The force employed should generally be sufficient to produce slight pain.

5. In cases of flexion, the flexion should, if possible, be straightened during the manipulation. In all cases of displacement the uterus must be restored to its proper position.

6. Care must be taken to have the patient breathe deeply and regularly during treatment.

Much more might be said respecting the non-surgical treatment of the diseases of women, and I might give a long list of cases illustrative of the value of the measures outlined; I will only say, however, in conclusion, that I know of no class of ailments in which rational non-surgical measures yield such brilliant results as in the treatment of this class of disorders. A few months' careful treatment and training suffices, in many cases, to restore the patient from a condition of apparent hopeless invalidism to one of robust health and active usefulness.

## GOOD-BY TO THE JUICY BIVALVE.

BY CHAS. E. STEWART, M. D.

THE issues of the *British Medical Journal* for September 12, 19, and 26, contain the special report of G. E. Cartwright Wood, M. D., B. S., on this subject. The report shows that the work has been done in a thoroughly scientific manner, and the results obtained are what one who is acquainted with the life history of micro-organisms and the habitat of shellfish would naturally expect.

At one time it was thought that there was a special idiosyncrasy on the part of

the individual in cases of poisoning from eating shell-fish, but this theory is no longer tenable, for it is a well-known fact that in many instances where some form of shell-fish have been served at large gatherings, every one who partook of them was poisoned.

It has frequently been stated that the symptoms were due to metal poisoning by copper. "One of the facts which has undoubtedly supported the belief in the copper-poisoning theory has been the frequent association of the place of origin of the mussels with shipping, as in the case of docks and harbors; but this, as we shall presently see, is capable of quite another interpretation. The whole history and symptoms of such cases of mussel poisoning are very similar to those cases of meat poisoning (so-called 'botulism') which have been frequently observed and described in recent years. That this is not a merely superficial resemblance has been shown by the researches of Brieger and Schmidtmann on the Wilhelmshavn epidemic which occurred in 1885." They were able to extract from the suspected mussels a very active poison, which they named mytilotoxin. This poison, the author stated, was the product of a special microbe, and was found by Wolff to be produced chiefly in the liver of the shell-fish.

It has recently been observed by Lustig, of Turin, that mussels found in the stagnant waters of harbors and canals are infected with two microbes, "the one innocuous, the other highly pathogenic." The highly pathogenic microbe, when injected into the intestinal tract of animals, rapidly causes death. "The lesson to be learned from these and numerous similar observations is, as we shall show, that no mollusks should ever be used as articles of diet, which have been obtained from waters subject to contamination, since this alone apparently (without the presence of specific infective disease germs such as those of typhoid fever or cholera) can give rise to most dangerous disturbances of the general health."

The old idea that oysters were free from the danger of producing the poisonous symptoms which had been observed to follow the ingestion of other forms of shell-fish, is no longer held. On the contrary, poisoning produced by the ingestion of oysters is of common occurrence, and accounts of such cases are frequently reported. Besides containing a poison which when taken into the system produces severe gastro-intestinal disorders and in many cases death, the oyster may be a means of conveying infectious diseases such as cholera and typhoid fever.

TYPHOID FEVER GERMS.

M. Chantemesse (*La Presse Médicale*) recently reported the results of an investigation made by him in several cases in which the patients had contracted typhoid fever after eating oysters. A bacteriological examination of the oysters revealed the presence of both the colon bacillus and the typhoid bacillus. The author states that "the contamination of oysters occurs in oyster beds at the mouths of rivers; the more heavily the rivers are charged with organic matter, the fatter the oysters become, and the more dangerous."

Within the last few years American physicians have reported a number of similar cases; and the thoroughness with which the work has been done proves quite conclusively that the oyster is another of the means by which pathogenic and other germs find their way into the human organism.

From the experiments that Dr. Wood has carried on, he has shown that the germs of typhoid fever and cholera live for months in sea-water. He found that sea-water inoculated with these germs contained on the first day 100,000 to 120,000 germs in each c.cm.; at the end of three months each c.cm. was found to contain 80,000 to 90,000 germs. Experiments were made with sea-water obtained from a large number of places, but the results obtained were practically the same

in all cases, "showing clearly that large numbers of these persist over as long a period as three months."

It frequently happens that before the consumer obtains his oysters they have been in the shop some days. A bacteriological examination of such oysters reveals the presence of large numbers of germs, these, in the majority of cases producing ptomains which, when injected into animals, produce deadly effects.

The following table shows the result of a bacteriological examination of oyster juice. These oysters were kept in tap water to which some salt had been added. The water was changed daily during the course of the experiment, and the basin was kept in a cool, well-ventilated room.

AVERAGE NUMBER OF COLONIES DEVELOPING FROM ONE CUBIC CENTIMETER (ONE-FOURTH DRAM) OF OYSTER JUICE.

| *First Day.* | *Second Day.* | *Third Day.* |
|---|---|---|
| 60 to 80 | 500 to 600 | 1700 |
| *Fourth Day.* | *Fifth Day.* | *Sixth Day.* |
| 2000 to 3000 | 5000 | 12,000 to 14,000 |

From this table it will be seen that the longer the oyster is kept out of its natural surroundings, the more dangerous it becomes to the consumer.

The following tables give a brief summary of the facts obtained from the examination of oysters obtained from different sources: —

FIRST-CLASS RESTAURANTS.

| Description of Oysters. | Average Number Organisms per dram of Oyster Juice. | Toxicity of Broth Cultures on Animals. |
|---|---|---|
| Natives | 44,000 | toxic |
| Dutch | 560,000 | |
| Natives | 300,000 | toxic |
| Best Seconds | 140,000 | toxic |
| Dutch | 720,000 | toxic |
| Best Seconds | 880,000 | toxic |

OYSTER SHOPS.

| | | |
|---|---|---|
| Whitstable Natives | 7,200 | toxic |
| Scotch Natives | 240,000 | toxic |
| Anglo-Dutch | 180,000 | |
| French-relaid | 120,000 | |
| Scotch Natives | 280,000 | toxic |
| Anglo-Portuguese | 64,000 | toxic |

Examinations of oysters from various other sources were made with practically the same results as shown in the preceding tables.

"The results of the examination of oysters from various sources, as they are supplied to the public for immediate consumption, show that the mollusks at that time frequently contain almost stupendous numbers of bacteria."

"From the experiments recorded in this report it must be accepted that the

CHOLERA GERMS.

disease germs (cholera and typhoid fever bacilli) with which we have here to deal, can probably exist in sea-water for at least two months, and that these would possibly, or even probably, still remain more or less virulent and infective in their character. The laboratory experiments carried out with infected oysters have shown that the cholera germs do not disappear as rapidly as stated by Giaxa, and we have every reason to believe from comparative experiments that other pathogenic microbes would persist in a similar fashion."

The results of Dr. Wood's experiments show clearly that the oyster is a dangerous article of diet, and a study of its structure and its natural surroundings substantiates this conclusion. It thrives best in sewage-polluted water, its food consisting chiefly of the organic matter and débris found in the water.

The oyster is a complex organism, and possesses two labial palps which overhang the mouth, an intestinal tract, and liver, kidneys, gills, heart, and nervous ganglia. Professor Huxley says of it, that "when the sapid and slippery morsel, which is and is gone like a flash of gustatory summer lightning, glides along the palate, few people imagine that they are swallowing a piece of machinery (and going machinery, too) greatly more complicated than a watch."

# TRANSLATIONS AND ABSTRACTS

[THE articles in this department are prepared expressly for this journal.]

## MEAT POISONING.

A CURIOUS case of poisoning has recently been reported from Sheffield. A Mr. Stead and his family ate heartily of brawn, and shortly after all became ill with violent abdominal pains, accompanied with much vomiting. Within a short time all the younger members of the family fully recovered, but the father developed symptoms of local blood poisoning, and his leg had to be amputated above the knee.

It is impossible, or at any rate difficult, to discuss a case on the meager facts supplied by a lay journal, because we cannot be certain of the sequence and consequence of events. If, however, the data are correct, the case is an interesting one, and serves to recall a fact which, perhaps on account of its rarity, is not sufficiently kept in mind. It is that septicemia, taking this term in its pathological sense — that is, hemic infection — may occur without any external wound, as apparently it did in this instance, from the alimentary tract.

It seems that in this case organisms found access to the bone marrow, whither they must have passed from the intestinal tract. It is now generally acknowledged that the bone marrow forms a good resting-place for micro-organisms. Thus the typhoid bacillus can frequently be recovered from the bone marrow after death, and on inoculating animals intravenously with typhoid bacilli, the latter may be found two to three weeks later in the marrow and spleen, when the heart's blood is already free from them. In the case of typhoid fever and other infections, pyogenic micro-organisms frequently find their way to the bone marrow, producing an osteomyelitis. It may be said that in the case of typhoid fever the intestines are ulcerated, and that thus a ready entrance into the circulation is offered to the bacteria.

This explanation does not, however, suffice in the case of other infective fevers, such as measles, scarlet fever, etc., where osteomyelitis is not unknown. We must allow that micro-organisms may find their way into the circulation, into the bone marrow, subcutaneous tissue, serous membranes, etc., without there being an obvious breach of surface or obvious communication with the circulation. Klein further has shown that a septicemia may be produced in animals by unsound food, or by feeding them with pure cultures of certain bacteria, which, on subcutaneous injection, have no effect on them.

This, then, is the important lesson: that food poisoning may lead to an infection, either a local one of the alimentary tract, a gastro-enteritis, or a general one, a true septicemia; and that just as in the case of typhoid enteritis, distal suppurative lesions may appear, either in the bones or subcutaneous tissues, so also it is not impossible that in an enteritis produced by other infective agents similar lesions may appear.

The etiology of infective endocarditis is often obscure, and its possible intestinal origin in some cases is perhaps never thought of. In typhoid fever, ulcerative colitis and dysentery and infective endocarditis occasionally form a fatal complication; and in the case of typhoid fever either pyogenic organisms or Eberth's bacilli are found in the heart, generally the former.

These considerations should lead us to extend our field of clinical observation, and to remember that if the outer surface of the body is but a slender barrier against hemic infection, the inflamed mucous membranes of the stomach and intestines certainly require as much attention. Obscure cases of pyemia, septicemia, or infective endocarditis may, in some cases at least, have their bacterial source in the diseased surface of the gastro-enteric tract.— *British Medical Journal, June 13, 1896.*

**New Mode of Disinfection and Sterilization.**— The Antwerp correspondent of the Liverpool *Journal of Commerce* says: —

"In all large ports the medical commission plays a very important and responsible part, and its duties have been all the more arduous during the last four years, since the United States has demanded such rigid examination of all

emigrants, their baggage, etc. In connection with sanitary arrangements and regulations of the port, some experiments of a most interesting character were made at the St. Pierre Hospital in the presence of the Antwerp Medical Commission. The subject of the experiments was the demonstration of a new and practical mode of disinfection and sterilization. The means employed consist of a gas obtained by the partial combustion of methylated spirits, which, while perfectly innocent in its effect upon human beings, being non-toxic and free from all corrosive action, is said to possess the property of destroying every trace of bacteria or microbes in the atmosphere of any inclosure. The experiments so far have been thoroughly successful.

"If such a system of disinfection can be proved efficacious, it will be a blessing to steamship companies plying between Europe and the United States; for in time of contagion of any kind the United States government demands fumigation by sulphur, which is a most disagreeable and unprofitable process. The question will be studied with a view to adapting it to the disinfection of ships, passengers, luggage, and cargo."

**Straightening the Spine by Wiring the Spinous Processes Together.**—Chipault's new method (*Journal Am. Med. Asso.*) of treating caries of the spine is described in the *Therap. Woch.*, No. 35. The spine is straightened and held in this position by wires that fasten the spinous processes together, so that the orthopedic appliances do not have to contend with the constant tendency to curvature. After chloroform, the patient is placed on his stomach, three-quarters pronation, the back turned to the operator. A longitudinal opening is then made along the spinous processes, two to three vetebræ above and below the limits of the curvature. Without touching the interspinous ligaments, both sides of the processes are exposed, and the soft parts drawn aside; the assistant at each end then pulls the spine to straighten it as much as possible, and a silver wire is passed through the interspinous ligament above the highest process to be ligated at the bottom near the root. The wire is then cut, leaving on each side a piece twice as long as the wound. The ligating is done with these two ends, crossing them back and forth and passing them through each interspinous ligament from the highest process downward until the lowest is reached, when the two crossed ends are twisted together. The wires must be passed through the ligaments close to the lower edge of the process above to afford as firm a support as possible. Each crossing must be tested to see if it is strong and taut before proceeding to the next. The soft parts are then sutured without drainage, bandaged, and the patient is placed in bed. The two difficulties, lateral curvature of the spine and anchylosis of adjoining processes, are met by boring a hole in the processes in the latter case, and in the former by extending the end of the wire on the convex side up to the loop at the top and stretching it tight, which also straightens the lateral curve. In cases of lumbar or dorsal caries, the bandage can be changed in five to six days, and in cervical caries in ten, and the stitches removed from the soft parts.

This ligature of the spinous processes is undoubtedly an advance in the treatment of Pott's disease, but it applies only to moderate curvatures of recent origin, that have commenced suddenly and developed rapidly and are capable of reduction in anesthesis, and to weak spines. It is not adapted to old curvatures or those involving too many of the vertebræ. The presence of an unopened cold abscess or of paralysis is no obstacle. Absolute immobilization should follow the operation.

**Sextuplets.**—A case is recorded by Vassali, in the *British Gynecological Journal*, 1895, of a case of sextuplets, in which the woman, who was a native of Italy, gave birth to six children, four of whom were males, and two females. There was but a single placenta.

**Massage in the French Army.**—The French Minister of War has decreed that hospital orderlies shall in future be taught the art of massage. Classes for this purpose will be instituted in Paris (Val-de-Grace Hôpital), at Lyons (Hôpital Desgenettes), and at Algiers (Hôpital du Dey). After a six weeks' course the pupils will be distributed among the principal military hospitals.

**The Treatment of Atony of the Small Intestine in Neurasthenics.**—Dr. Chalmet, believing that whether the nervous system presiding over the epithelial (secretion and absorption) and muscular functions may or may not play the principal part in this condition, the best method of improving the tone of the nerve is to nourish it better. To improve nutrition he administers during the early hours of intestinal digestion a salt-water enema of a concentration above that of blood serum—*e. g.*, 0.1 to 1.2 per cent. of salt—in order that he may produce in the large intestine an osmotic current which shall act at a distance upon the small intestine, retarding absorption and permitting the transformation of food-stuffs to go on for a longer period before absorption of the liquid containing these substances in solution.—*Journal des Praticiens, 1896, No. 18, p. 276.*

**Effects of Flesh-Eating on Teeth.**—In the present flesh-eating age of Great Britain, perhaps no complaint is more general than caries of the teeth; and as animal food is a frequent cause of indigestion, it thus conduces to the decay of those useful portions of the human fabric. But there is a more direct mode by which animal food produces this effect. Bell, Fox, and other writers attribute the decay of the teeth to inflammation situated either in the lining membrane or the bone proper of the teeth; but Dr. Robinson proves—by a number of considerations drawn from the structure, physiology, and development of the teeth, and from operations performed on them—that caries is the chemical result of decomposed food upon the teeth, and not the result of inflammatory action.

Upon examination it will be found that there are fissures formed in the enamel of the teeth, in consequence of the irregular distribution of that substance upon the surface; also, that there are interstices, produced by the crowded position of the teeth and irregularity of their shape; and, as the fibers of animal food retained between the teeth undergo a process of decomposition by the action of oxygen they acquire the property of corroding, disuniting, and thereby destroying the earthy and animal substances of which the teeth are composed. At first there is formed but a very small hole, which is increased by the daily action of the same causes; the phosphate of lime is gradually disintegrated by the carbonic acid, aided by the secretions of the mouth, until at length the nerve becomes exposed, and toothache is the result. Vegetable food is not so liable to be detained between the teeth; and when this does occur, it is not so injurious, because the starch of which such food principally consists is much more easily acted on by the saliva, and converted into gum or sugar—one of the nutrient principles. The popular notion that sugar injures the teeth is incorrect, except in cases where, by its admixture with other substances, it causes indigestion. "It has been alleged," says Dr. Wright, "that the eating of sugar spoils the color of and corrupts the teeth. This, however, proves to be a mistake; for no people on the earth have finer teeth than the negroes of Jamaica."—*Fruits and Farinacea.*

**Potassium Permanganate in the Treatment of Opium-Poisoning.**—Dr. Arthur P. Luff believes that his experiments demonstrate the selective faculty of this drug for morphine in the stomach contents, and confirms Moor's conclusion as to its value as an antidote. When the quantity is known, the antidote should be given slightly in excess of the morphine. If laudanum in known quantity has been taken, six grains should be given for each fluid ounce of poison. If the amount of morphine or opium is unknown, eight to ten grains should be administered, according to the severity of the symptoms, dissolved in from four to eight ounces of water. The stomach should be washed out at half-hour intervals with a weak solution of the antidote. In cases of poisoning by the hypodermatic injection of morphine the hypodermatic injection of the antidote would not be likely to be of use. In cases of threatened respiratory failure, strychnin, preferably, or atropin should be given hypodermatically, and, if necessary, artificial respiration be resorted to.

Mr. F. P. Maynard states that this is a strictly local antidote, acting only upon such opium as it comes in contact with in the stomach, and can have no effect upon such as has already been absorbed. The treatment, however, is excellent, as leading to a thorough washing out of the

stomach, and at the same time affording a reliable indication when this has been accomplished. It is not to be expected that it will save life when a lethal quantity has already been absorbed into the circulation, nor can it be regarded as a physiological antidote, as is eserin to atropin. — *British Medical Journal, 1896, No. 1846, p. 1193.*

**Statistics of the Treatment of Diphtheria with Antitoxin.** — Loddo (*Rif. Med.*, July 11, 1896) has put together the various official statistics on this treatment in Europe, America, Australia, and Japan. They include about 10,000 cases treated in eighty-six hospitals, with a mean mortality of 18 per cent. Fifty-three of these hospitals furnish comparative statistics of treatment with and without serum; 7277 cases were treated with serum, giving a mean mortality of 20 per cent. as against a previous mortality of 44.3 per cent. In addition to the above 10,000 cases, Guérard has collected the accounts of 3760 cases treated with serum in private practise; here the mortality was only 7.8 per cent. Adding these to the others, there was a mortality of fifteen per cent. on the 13,760 cases. The author then cites a series of figures which tend to show that serum-therapy is of little value, and may even be harmful. Of these latter, about 3000 cases are collected, giving an average mortality of nearly 23.4 per cent.

**Influence of Hot and Cold Baths on the Chemical Changes of the Blood and Urine.** — Strasser (*La Semaine Medicale*) finds in his experiments with hot and cold baths, that when the cold bath is used, the amount of alkali in the blood is increased, and the acidity of the urine diminished. Hot baths, on the other hand, seem to increase the amount of acid in the urine, while the amount of alkali in the blood is diminished. As both hot and cold baths increase the amount of chemical changes, the author explains the results which he obtained as follows; viz., that hot baths produce rather an organic dissociation than an oxidation, while cold baths produce the opposite effect. Capper has shown that the urine, which becomes alkaline with a vegetable diet, will become acid under the influence of the cold bath. Strasser ascribes the alkalinity of the urine to the excess of alkaline carbonates; and as cold baths increase the elimination of carboinc acid through the lungs and the skin, the urine thus ceases to be alkaline.

**Action of the Stomach During Sleep.** — Examinations of the contents of the stomach obtained in sleep have convinced Schule (*Berlin Klin. Woch.*) that the acidity of the stomach is greater during sleep, and that its motility is lessened at that period. Persons with digestive trouble, therefore, especially if hyperacidity is present, ought not to sleep after eating. Instead, the meal should be followed by wakeful repose.

**Two Cases of Heart Disease Treated by Saline Baths.** — Dr. G. V. Poore, in describing this treatment, (*British Medical Journal*, 1896, No. 1845) states that the baths used contained four pounds of sodium chlorid and six ounces of calcium chlorid to forty gallons of water. The temperature of the bath was 95° F., and the time of immersion was limited to eight minutes. The first of the cases treated in this way was one of aortic obstruction and insufficiency, in which the murmurs were exceptionally loud. After the bath the area of cardiac dulness was diminished, and the transverse and vertical measurements proportionately decreased; the character of the murmurs was unchanged. The second case was one of aortic obstruction and insufficiency. After each of the four baths the area of cardiac dulness diminished both vertically and transversely.

**Poisoning by Stale Eggs.** — Cameron (*Dublin Medical Journal*, October, 1895, p. 311) has reported the occurrence of vomiting and purging in seventy-four nuns and girl pupils in the boarding-school attached to a convent in Limerick, following a dinner at which mutton and a custard composed of eggs, milk, corn-flour, and sugar, were eaten. The corn-flour was suspected of containing arsenic, but analysis showed it to be free from poison of any kind, and to be of good quality. The sugar also proved

to be pure. No other constituents of the meal could be obtained. The vomit and the stools were intensely green from the presence of biliary matter, but careful analysis failed to disclose the presence of ordinary poison. The viscera of two patients that had succumbed were also examined, but no poison was found. Ptomains were found present, but in small quantity. The milk used had been boiled, and the meat was above suspicion. The eggs, however, were not fresh, and one presented a reddish-brown color, and was thought to be bad. Some of the custard was given to the pigs, and induced severe diarrhea.

**Treatment of Diabetes.**— At the recent French Congress of Internal Medicine (*Sem. Méd.*, August 19) Moussé, of Toulouse, said he had tried antipyrin with the object of diminishing the amount of sugar, uric acid, and urea, but that the diminution had only been fleeting. The author therefore concludes that antipyrin should not be prescribed for diabetes. He has also tried beer yeast and fresh pancreas, but with no better results. In his opinion the corner-stone of treatment in diabetes is diet; if drugs are used, their effect should be closely watched, as they are not infequently hurtful.

**Fatal Poisoning by Oysters.**— Dr. Anton Brosch (*Wiener Klin. Woch.*, 1896, No. 13, S. 219) reports a very carefully observed instance. The following pathological conditions were present: Hemorrhages the size of a pin-head in the cerebellum, edema of the spinal pia, and hemorrhages in the gray matter, especially in the dorsal and lumbar regions, also in the pleura and lower portion of the ileum. The cardiac portion of the stomach was ecchymosed, and the spleen enlarged. The microscope showed the presence of an advanced parenchymatous degeneration of the muscular fibers of the heart and of the renal epithelium. The protoplasm of the liver cells was filled with large and small fat-balls. The cell-wall and the nuclei were not changed. The hemorrhages were probably due to the manner of the death, and not to the poison itself. Although the chemical examinations are unsatisfactory, the clinical picture is distinct, and should not be mistaken.

These cases should be separated into two classes, the bacterial cholerines and the severe poisonings. In the first, evacuants and disinfectants should be given; in the latter, the stomach should be cleansed by the pump and the intestine by high irrigation; frequent evacuations of the bladder by catheterization should be induced, and artificial alimentation by the stomach-catheter, and artificial respiration resorted to if necessary.

**Galvanic Current in the Treatment of Lead Colic.**— Drs. Labadie, Lagrave, and Regnier report (*Charlotte* [N. C.] *Medical Journal*) the successful treatment of four severe cases of lead colic by means of the galvanic current. In each case the pain was at once relieved, and recovery quickly followed. The method of application is as follows: —

A large zinc plate electrode is placed over the abdomen, and a rectal electrode passed into the anus; this is connected with a syringe, so that a stream of water can be kept constantly flowing around the rectal electrode to prevent injury to the bowel. The abdominal electrode is first connected with the negative pole, and a gradually increasing current passed through until twenty to forty milliamperes is reached. It is then reduced to zero, and the current reversed, when the same process is repeated. This time the current is interrupted at intervals at such a strength that it produces a contraction of the abdominal muscles. The current is then gradually reduced to zero, and the "galvanic injection" is complete. This method of procedure generally produces a complete evacuation of the bowels.

In cases in which it is only necessary to stop the pain, the following method may be employed: Place the positive pole over the three lower dorsal vertebræ, and the negative pole over the pit of the stomach, using five to ten milliamperes of current.

**The Operative Treatment of Jacksonian and Focal Epilepsy.**— C. B. Nancrede (*Annals of Surgery*, August, 1896) reports some cases of Jacksonian and focal epilepsy which he has operated upon. The course pursued by other cases of epilepsy upon which he has operated

confirm the conclusions to which he has reluctantly been forced; viz., that —

1. Removal of the discharging lesion in cortical and Jacksonian epilepsy can only be regarded as palliative, the operative scar, in all instances thus far accessible to him, in time becoming a new source of irritation.

2. The earlier the operation is done after the disease becomes fully established, the longer will the immunity last; and it is possible that if trephining be done very early, the operation may in a few instances prove curative, especially if any reliable method can be devised to lessen the extent of the inevitable scar and adhesions between the brain and the membranes.

3. The operation is not so dangerous in competent hands as to forbid our urging trephining in this class of epilepsies, especially when done early, because the chance of prolonged immunity is great, and the fits are apt to become lighter, and to recur at greater intervals after relapse than before trephining.

4. Removal of the discharging lesion is imperatively demanded as a life-saving measure in those rare cases where the intervals between the fits are so short that the paroxysms are practically continuous.

5. In all cases, but especially those characterized by frequent paroxysms, it is an error in practise to permit the early resumption of work by the patient, particularly manual labor.

**Tight Lacing.** — Dr. F. Schuman Leclercq (*Virginia Medical Semi-Monthly*, May 22, 1896) says that, according to Naunyn, constricted liver from lacing is found in from 20 to 20.5 per cent. of the cases examined, but Schroeder states this malformation to be present in 59.5 per cent. When we stop to consider that even moderate lacing impedes considerably the flow of bile without necessarily giving origin to an anatomical groove of constriction, we can claim even a higher percentage of gall-stone disease as being called forth by lacing. However, even the tying of skirts around the abdomen will in due time at least relax the abdominal muscles and interfere with the abdominal pressure, or bring forth other active etiological agents, such as tractions on the gall ducts, on the ligaments, interference with the physiological gall-bladder contractions, causing floating kidney, etc. Any corset and any tight fastening of skirts around the waist must needs in time dislocate at least the liver, the stomach, or the colon to a more vertical position, and tractions between these organs will ultimately loosen the protective, complicated, ligamental apparatus of nature. We cannot, therefore, sufficiently praise the honest and noble efforts of the reform corset movement, with skirt suspension from the shoulders. — *Medical Record.*

**Application of Gastric Juice in Therapeutics.** — At a recent meeting of the Académie de Médicine, Fremont announced that he had obtained very satisfactory results in relieving and curing gastric disturbances such as enteritis, grippe with gastro-intestinal complications, apepsia, etc., by administering gastric juice obtained by isolating the stomach of dogs.

**A Strange Remedy.** — The *British Medical Journal* reports the curious fact that cow dung is still used in some parts of England as a poultice in case of abscess of the breast.

**The Konig-Maas Method of Restoring Persons Apparently Dead from Chloroform.** — (*St. Louis Med. Era.*) Standing on the left side of the patient and facing him, place the ball of the thumb of the right hand at a point on the patient's chest between the apex-beat and the sternum. Repeatedly press in the thoracic wall with a quick, strong movement, at the rate of thirty to one hundred and twenty times to the minute.

**Treatment of Ozena with Diphtheria Antitoxin.** — The *Medical Week* for May 1 contained a report by Drs. Bellfanti and Vedova, of the treatment of thirty-two cases of ozena by the injection of diphtheria antitoxin. Ten c.c. were injected daily or every other day. On an average, thirty c.c. were required to effect a cure, — which occurred in a majority of cases. The first effects were congestion of the nasal mucous membrane, which was soon followed by a disappearance of the fetid odor, and cessation of the formation of crusts. No unpleasant symptoms were produced.

# BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE AND BACTERIOLOGICAL REVIEW, from original sources.]

**Bacteria in the Urine in Non-bacterial Febrile Disease.**— Chvostek and Egger (*Wiener Klin. Woch.*, 1896, No. 30) report the occurrence of bacteria in the urine in paroxysms of malaria and in fever produced by injections of tuberculin. As the experiments were conducted in such a way as to exclude the usual causes of error in such observations, the authors believe that fever serves in some way to favor the excretion of micro-organisms, though no bacterial disease in the usual sense exists. They suggest that this may be simply the exaggeration of a process which must occur at times in healthy persons. Bacteria gain entrance to the blood in various ways, perhaps most frequently by way of the lymphatics, and are finally excreted with the urine. These germs are probably more or less lowered in vitality, so that they cannot often be cultivated successfully; but in fevers such as the authors worked with, the excretion is more rapid. These and other observations show that the presence of non-specific bacteria, especially the staphylococcus albus, in the urine cannot be looked upon as of great importance, and that other facts must be brought forward in order to prove their relation to the disease.

**A New Culture Medium for the Diphtheria Bacillus.**— Joos (*Jour. Méd. de Bruxelles*, May 7, 1896) has had occasion to make a large number of bacteriological examinations in cases of suspected diphtheria. He finds that the ordinary methods of cultivating Löffler's bacillus are not satisfactory; he also finds Deycke's method unsatisfactory, as it hinders the growth of the Löffler bacillus, and stunts the colonies. Joos has modified Deycke's medium, and claims to have found a material on which no other bacillus except that of diphtheria will grow normally. He prepares "albuminate of soda" by adding saturated caustic soda solution to serum of strong alkalinity, placing the mixture in a vapor bath for half an hour, and filtering. To the filtrate is added pure hydrochloric acid till the reaction is neutral or very slightly alkaline. If too much caustic soda was not added at first, the substance is now ready for use; otherwise the excess of sodium chlorid requires to be dialyzed out. On evaporating to dryness, a powder is obtained which is readily soluble in water, and which is not coagulated by heat. The nutritive medium is prepared by adding to 1000 gr. of peptonized bouillon 20 gr. each of agar and "albuminate of soda." The mixture is placed in the autoclave at a temperature of 115° to 120° C. for half an hour; then 15 c.cm. of caustic soda are added, and the whole put back in the autoclave for fifteen minutes, after which it is filtered in the vapor bath. After filtration it is sterilized at 120° C. in the autoclave for three quarters of an hour, when it is ready for the preparation of the plates. It is claimed by Joos that streptococci will not grow on this medium at all, and staphylococci but feebly, while Löffler's bacillus grows luxuriantly in from six to twelve hours. If the presence of streptococci is to be determined as well, the amount of "albuminate" is to be reduced to one and one-half per cent. At the end of fifteen to eighteen hours small colonies of streptococci may be seen among the large and well-developed patches produced by the diphtheria bacillus.

**Meningitis in Enteric Fever.**— Kuhman (*Berlin Klin. Woch.*) observes that the disproportion between the cerebral symptoms in typhoid fever and the morbid lesions found in the nervous system have long attracted attention, and that these pseudo-meningeal symptoms are well known to experienced observers. Purulent meningitis has occasionally been seen in enteric fever. It has been put down as a mixed infection due to pyogenic micro-organisms, but it has been shown that the typhoid bacillus has pyogenic properties, and can produce this purulent meningitis. The author relates a severe case of enteric fever in a man aged thirty-two, accompanied by hemorrhage, and complicated by purulent meningitis. A bacteriological examination of the blood during life showed colonies of the typhoid bacillus. The cerebral symptoms did not appear until the thirty-second or thirty-third day of

the disease. The patient rapidly became somnolent, the pulse irregular, and the urine and feces were passed unconsciously. The pupils were equal, but reacted sluggishly. There was slight retraction of the head, but no optic neuritis. Death occurred on the thirty-sixth day, in profound coma. The typhoid ulcers were nearly all in process of healing. Numerous typhoid bacilli were still present in Peyer's patches. There were slight microscopic changes in the renal epithelium. After the removal of the dura mater, the convolutions were seen to be covered with purulent exudation. The pus was intimately connected with the pia mater. A bacteriological examination showed the presence of the typhoid bacillus in the mesenteric glands, spleen, and exudations.

**Leucocytes and the Bactericidal Action of the Blood.**— Hahn (*Arch. f. Hyg.*, vol. xxv, p. 105) has investigated the action of blood serum and also the pleural exudation of rabbits. The leucocytes in the latter are destroyed by freezing. He found that the exudate had a more powerful bactericidal action upon staphylococcus pyogenes aureus and bacillus typhosis than the blood serum or the defribinated blood of the same animal; and since the leucocytes were destroyed, the action cannot depend upon phagocytosis in Metchnikoff's sense of the term. The author made experiments with Lichenfeld's histin-blood, in which the leucocytes remained unaffected, in order to determine whether the bactericidal power depends upon the destruction of leucocytes or upon substances secreted by the leucocytes while still alive. He came to the conclusion that the latter is the more probable explanation.

**Presence of the Typhoid Bacillus Outside of Typhoid Patients.**— A number of experiments have been made by Remheifer and Schneider (*Am. Journal of the Medical Sciences*, October, 1896) with water, soil, and fecal material from non-typhoid subjects, for the purpose of ascertaining if the typhoid bacillus could be isolated from them. Elsner's medium was used. It was found that in thirty-six specimens of water examined, eight of them contained bacilli which, morphologically and culturally, resembled the typhoid bacillus. Besides these characteristics they all presented the property which has been spoken of as "glabrification;" that is, an animal which, under usual circumstances, would succumb to their inoculation, could be protected against them by typhoid antitoxin.

Cultures made from specimens of earth showed the same bacillus in six. Finally a bacillus identical with Eberth's was found in the stools of three individuals suffering respectively from leucemia, malaria, and Bright's disease, but who had never had typhoid. In five other cases a negative result was obtained. Of the eighteen organisms obtained from these different sources, twelve were pathogenic for animals, and the animal could be protected against a fatal issue by the use of antityphoid serum.

The authors think that these researches throw some light on the general etiology of typhoid, and point to the possibility of autoinfection.

**Infection by Pets.**— Cats have been suspected of conveying the infection of diphtheria, and scarlet fever has been traced to them. To this may be added (*Chicago Medical Record*) the unwelcome news that a health officer has reported a case of smallpox brought about in the the same way; that is, by a cat from an infected house carrying the disease to a neighboring house.

Another case is reported in *La Médecine Moderne*, "of a seamstress who was in the habit of allowing her dog to lick her face. She was attacked one day with a severe inflammation of the right eye. Oculists were consulted, but their treatment was unsuccessful; and owing to the fact that inflammation of the left eye was beginning, the right eye was cut out. In it was found a tapeworm, which the dog had probably picked up while licking some less pleasing object than his mistress's face.

"The danger of the transmission of parasites by dogs, who are well known to be indiscriminate in choosing objects for the exercise of their tongues, to the hands and faces of their masters, would seem to be a great one. It is remarkable that accidents of the kind related happen as rarely as they do."

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## INCREASE OF THE CONSUMPTION OF HORSE-FLESH.

THE first shop for the sale of horse-flesh was established in Paris in 1866; at the present time there are two hundred such shops. In 1872, five thousand horses were eaten in Paris; in 1895, more than thirty thousand.

But the consumption of horse-flesh is not confined to Paris. There are at least two extensive establishments in this country devoted exclusively to the business of canning horse-flesh. There seems to be no physiological objection to the use of horse-flesh as meat. A Frenchman who had frequently eaten it told the writer, some years ago, that the only objection the French people have to its use is that it is too sweet. This sweetness is due to the well-known fact that the flesh of the horse contains a much larger proportion of muscle-sugar than does the flesh of other animals.

The extensive consumption of the flesh of animals by civilized nations is one of the paradoxes of which civilized society presents not a few. Socrates, whose philosophy has had so mighty an influence in the establishment of the foundations of civilization, is represented by Plato in his "Republic" as teaching abstinence from the flesh of animals as one of the conditions essential to the highest good of a civilized community. A conversation is related purporting to have taken place between Socrates and Glaukon upon this subject. It runs thus: —

"'They [the artisans and working people generally] will live, I suppose, on barley and wheat, baking cakes of meal, and kneading loaves of the flour; and spreading these excellent cakes and loaves upon mats of straw or on clean leaves, and themselves reclining on rude beds of yew or myrtle boughs, they will make merry, themselves and their children, drinking their wine, weaving garlands, and singing the praises of the gods, enjoying one another's society, and not begetting children beyond their means, through a prudent fear of poverty or war.'

"Glaukon here interrupted me, remarking, 'Apparently you describe your men as feasting, without anything to relish their bread.'

"'True,' I said, 'I had forgotten. Of course they will have something to relish their food. Salt, no doubt, and olives, and cheese, together with the country fare of boiled onions and cabbage. We shall also set before them a dessert, I imagine, of figs, peas, and beans; they may roast myrtle-berries and beechnuts at the fire, taking wine with their fruit in moderation. And thus, passing their days in tranquillity and sound health, they will, in all probability, live to an advanced age, and dying, bequeath to their children a life in which their own will be reproduced.'

"Upon this, Glaukon exclaimed, 'Why, Socrates, if you were founding a community of swine, this is just the style in which you would feed them up!'

"'How, then,' said I, 'would you have them live, Glaukon?'

"'In a civilized manner,' he replied. 'They ought to recline on couches, I should think, if they are not to have a hard life of it, and dine off tables, and have the usual dishes and desserts of a modern dinner.'

"'Very good; I understand. Apparently we are considering the growth, not

of a city merely, but of a *luxurious* city. I dare say it is not a bad plan, for by this extension of our inquiry we shall perhaps discover how it is that justice and injustice take root in cities. Now, it appears to me that the city which we have described is the *genuine* and, so to speak-*healthy* city. But if you wish us also to, contemplate a city that is suffering from inflammation, there is nothing to hinder us. Some people will not be satisfied, it seems, with the fare or the mode of life which we have described, but must have, in addition, couches and tables and every other article of furniture, as well as viands. . . . Swineherds, again, are among the additions we shall require — a class of persons not to be found, because not wanted, in our former city, but needed among the rest in this. We shall also need great quantities of all kinds of cattle for those who may wish to eat them, shall we not?'

"'Of course we shall.'

"'Then shall we not experience the need of medical men also to a much greater extent under this than under the former régime?'

"'Yes, indeed.'

"'The country, too, I presume, which was formerly adequate to the support of its then inhabitants, will be now too small, and adequate no longer. Shall we not say so?'

"'Certainly.'

"'Then must we not cut ourselves a slice of our neighbor's territory, if we are to have land enough both for pasture and tillage? while they will do the same to ours if they, like us, permit themselves to overstep the limit of necessaries, and plunge into the unbounded acquisition of wealth.'

"'It must inevitably be so, Socrates.'

"'Will our next step be to go to war, Glaukon? or how will it be?'

"'As you say.'"

At the rate with which we are now advancing in creophagy, it will not be more than a quarter of a century before deviled cat, fricasseed dog, and a variety of similar dishes will appear upon our bills of fare alongside of baked opossum, donkey sausage, and caviare, unless we adopt Haig's theory of the origin of uric acid and the extent of mischief arising from this poison, and return to a primitive diet of fruits and grains and the pure products of the earth.

## PRESERVATION OF URINARY DEPOSITS.

HERETOFORE the subject of mounting and preserving urinary deposits has received comparatively little attention, perhaps from the fact that no suitable method has been discovered. Specimens of urinary deposits, when properly mounted, are an excellent means of demonstrating the various pathological elements found in urine. We are indebted to Gumprecht (*Centralblatt f. Inn. Med.; British Medical Journal*, September, 1896) for the following method, which he finds to be superior to chloroform or glycerin: A deposit is first obtained by means of the centrifuge. This deposit is then placed in a concentrated solution of corrosive sublimate and centrifugalized again. It is then washed, and preserved in a solution of formal. The hardening in sublimate may be omitted if no red blood-cells are present. If there is much albumin present, the deposit may be washed with advantage in a normal saline solution. If the urine contains urates, the deposit should be washed with warm water or a concentrated boracic solution. The washing of a deposit by means of the centrifugal machine has long been in use in the laboratory. No washing is necessary if sublimate is not used. The strength of the formal solution may vary from two to ten per cent. The author says that urinary deposits thus preserved can hardly be distinguished from fresh deposits. Cover-glass preparations may be made, but it is well to wash off the formal. The cells maintain their shape,

and the nuclei of the cells take the stain in the usual way. Casts, and especially red blood-cells, are well preserved. Fat is readily distinguished. Micro-organisms are easily recognized even when unstained. C. E. S.

## ELIMINATIVE TREATMENT IN ALBUMINURIA.

So far as is known, there are no remedies which directly control the changes which take place in the kidneys. The only rational means we know of in cases of albuminuria are those which, when employed, will relieve the kidneys of the greater part of their accustomed work; namely, their excretory function. This can be done by utilizing the skin and bowels. Various means are employed to cause the patient to perspire; the following is the method employed by Carrien, of Montpelier, which he considers preferable to the vapor or hot water bath: The requirements are a bed with a cradle to raise the bed-clothes, and a spirit stove with pipe directed under them. The patient's head being outside the clothes, the rest of his body is kept exposed to the hot air (40° C.) for twenty minutes. This is repeated every three or four days. The immediate physiological effects are a not disagreeable feeling of warmth, profuse perspiration accompanied by acceleration of pulse (on an average about twenty beats per minute above the normal rate), and rise of temperature of one or two degrees. Respiration is not in the least embarrassed. There are no ill-effects except palpitations and headache during the first baths. These symptoms last for an hour after the bath, then gradually pass off; the perspiration is the effect which lasts longest. The therapeutic effects are shown by modifications in the urine; the amount diminishes the day after the bath; then on the following day there is marked but transient polyuria, as though the kidney acted better after the short rest. The density of the urine is in inverse ratio to the amount. The urea undergoes no change. The proportion of albumin becomes much less the day after the bath, increasing on ensuing days, but not reaching the former amount. Gradually the diminution becomes persistent, and the albuminuria may even disappear. This is an excellent mode of treatment, and one which can be utilized in private practise without any great inconvenience; and when used in conjunction with a proper dietary, good results may be expected. Where the electric-light bath can be used, excellent results may be obtained with a less degree of discomfort to the patient. More thorough and complete elimination can be obtained by the use of this bath in a shorter time than in any other way we know of. The light of the bath has a very salutary influence on the patient, and the physiological effects are much more pleasant than in any other form of eliminative treatment. C. E. S.

## THE STRUGGLE FOR LIFE.

THE discoveries of Pasteur, Koch, and others who have devoted themselves to the development of the science of bacteriology, have brought us face to face with the fact that man is constantly surrounded by multitudes of minute and potent enemies to life, and that he is only able to prolong his existence by the maintenance of a constant warfare. How this struggle for life is carried on has been very clearly shown by Metchnikoff and others who have penetrated deeply into the mysteries of cell life, and have actually been eye-witnesses to the combat between the living animal cells and the assailing microbes. To one who has been acquainted with the properties of microbes, with the terrific virulence which they sometimes possess, and the almost incredible potency of the poisons produced by them, it is indeed a marvel that any human beings

or animal forms of any sort are able to exist. A deeper study of the subject, however, reveals to us the fact that, while man is thus surrounded by the most deadly and potent enemies of life, he is, nevertheless, by nature,—so long as he conforms perfectly to the laws of health, thereby retaining a state of physical soundness,—able successfully to resist the attacks of all known germs. This fact is very well expressed by the eminent physician and physiologist, Professor Bouchard, of Paris, who, in his epoch-making book on the auto-intoxications ("Leçons sur les Intoxications"), speaks thus upon this subject: —

"That which renders possible the development of an infectious disease is not the accidental meeting of a man and a microbe. Such encounters are constant, but are generally without result. Microbes, even the most dangerous, besiege us. They are spread about us by nature with the same prodigality with which the sea distributes the pollen of flowers and other fertilizing material, notwithstanding their reproduction is rare. Infectious maladies are thus accidental, since it is but rarely that the infectious agent finds favorable circumstances for its development and multiplication, after its penetration of the organism.

"The healthy man is not hospitable to microbes. Although constantly invaded, he reacts against them, and in this battle generally maintains the ascendancy to such a degree that even the presence of the disease is often not apparent.

"It is not the same, however, when his vitality is lowered; then his means of defense are diminished. Just as we see rushes growing upon portions of the earth where isolated circumstances prevent the natural flow of the current, so certain microbes may invade a human body the health of which is impaired, when, in consequence of some disturbance of nutrition, the chemical constitution of the organ is modified.

"It is, then, a preliminary modification of nutrition which renders infection possible. The disease is thus the result of two different processes, one of which assists the other; in fact, pathogenic processes are rarely isolated. In the immense majority of cases they are associated and combined.

"This complicity we find not only in cases of contagion, but also in the most simple maladies,—in traumatisms, for example. . . . The disorganization of the cells opens the door to infectious agents, and prepares for them material which they must destroy. In addition, the nervous elements generally become involved, and, through them, reflexes are provoked, some of which manifest themselves in the wounded part where the blood supply, the circulation, and the nutrition are all disturbed; while others react upon the entire body, causing increased activity of the heart, accelerated respiration and disturbance of tissue changes in the entire body, increasing the amount of carbolic acid and urea.

"The nervous reaction thus not only adds to the local manifestation of some special features, but associates the entire organism with the process which is in operation in the wounded part. In the same way nervous reactions nearly always give rise to other concurrent pathogenic processes. Nervous excitation, cold, and moral or traumatic shock may give rise to syncope, epistaxis, diarrhea, and polyuria. But these are not diseases. A real disease, when it is not the result of a nervous reaction, requires . . . (save in cases in which the stimulation is excessive, and those in which the nervous system is abnormally excitable) a preparatory deterioration of the body.

"In whom does a cold produce a coryza or a bronchitis? 'In everybody,' you may say. This may be, but especially in those persons whose health is permanently or temporarily disturbed, especially in persons of an arthritic or

scrofulous diathesis. In these persons you will observe that a passing nervous reaction produces lasting effects; the coryza is tenacious, but the bronchitis is opinionated. The disease may be occasioned by a nervous reaction, but it is the preparatory deterioration of the organism which facilitates its onset, and which often renders it persistent and chronic."

**Remarkable Statistics.** — Statistics from the board of health of the city of New York give the number of deaths from diarrheal diseases and from all causes during the past four years. The following is the table: —

| Year. | Total Deaths. | Death Rate. | Diarrheal Deaths. | Disease Rate. |
|---|---|---|---|---|
| 1892..... | 5,463 | 38.37 | 1,635 | 11.49 |
| 1893..... | 4,704 | 32.09 | 1,383 | 9.44 |
| 1894..... | 4,521 | 30.05 | 1,197 | 7.94 |
| 1895..... | 4,481 | 28.61 | 1,178 | 7.52 |
| 1896..... | 4,238 | 26.29 | 973 | 6.04 |

When we consider that the city of New York has steadily increased in population during these years, and that the death-rate has diminished nearly one half, we naturally look for the cause of this great diminution in the death-rate. The president of the board of health attributes this to four principal causes; viz., clean streets, asphalt pavements in the tenement-house districts, an improved milk supply, and the increased use of sterilized milk for infants. C. E. S.

# REVIEWS.

THE UNQUARANTINED PESTILENCE. — By Evan O'Neill Kane, M. D., Kane, Pa. Published at Cincinnati, Ohio.

Dr. Kane raises his voice in warning against the dangers to which innocent people are exposed through the utter neglect, on the part of the civil authorities, of the matter of the protection of the public against infection from diseases resulting from impurity. The author estimates the number of persons infected by diseases of this character at some time in their lives, to be not less than one twentieth of the entire population. He maintains that while we are insisting upon quarantine against scarlet fever, smallpox, diphtheria, and even measles and other diseases less dangerous, and are even seriously considering the establishment of quarantine against consumption, we are guilty of gross neglect in omitting to institute effective measures for the prevention of the propagation of diseases which are quite as formidable, when considered from the standpoint of their results, as any of those mentioned.

Every physician must certainly recognize the justness of the author's views; but the problem to be solved is, How can an effective quarantine be carried out without invading individual rights? and without the establishment of an institution which, under the general name of the "Contagious Diseases Act," has been, and is still, opposed on moral grounds by those whose influence and feelings in this matter must certainly be respected? It seems indeed to be just that all persons suffering from contagious disease should be placed under quarantine, and it is to be hoped that some method may be devised whereby the principle of restriction may be applied to all classes of diseases which threaten public health. We could not for a moment, however, countenance any method for such restriction which would make a distinction in the manner of dealing with men and with women.

This subject is one which should be earnestly and carefully studied. That a different method must be found than that which has heretofore been undertaken in some European cities is well shown by the report of a commission appointed for the purpose of investigating this subject in the city of Berlin, Germany. This committee has Professor Virchow at its head, and its conclusion must be considered as the result of careful scientific inquiry and mature deliberation. The following are among the conclusions arrived at by this commission: —

1. Sanitary control of prostitution, alone, is insufficient effectually to subdue venereal diseases.

2. Syphilitic infection is much more common among the inmates of brothels than among isolated or clandestine prostitutes, the number of cases of infection in brothels being nearly double in Paris, and in Antwerp six times as great. Fournier found, in 873 cases of syphilis, only seven per cent. in which infection had occurred through clandestine prostitution, and seventy-three per cent. through infection from registered prostitutes who were regularly examined.

3. The ordinary methods of examination are exceedingly inefficient, bacteriological examination showing infection to be present in a large proportion of the cases which are pronounced free from disease.

# The Battle Creek Sanitarium
# LABORATORY OF HYGIENE.

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**Monthly Résumé of Work Done.**

## DETERMINATION OF THE CAPACITY OF THE STOMACH.

THE determination of the capacity of the stomach by the method recently described in these columns has been continued in the laboratory, in appropriate cases, with most interesting results. The conclusion reached in the article describing the method; viz., that normally the stomach has 1 c.c. of capacity to each millimeter of the person's height, is substantially confirmed by the study of a considerable number of healthy persons. We give herewith a report of the results obtained in the determination of the capacity and contents of the stomach in recent cases, and also, in connection with this data, the results obtained by chemical analysis in the same cases.

| No. | Y. | Ht. | Coef. |
|---|---|---|---|
| 1 | 2167 | 1828 | .84 |
| 2 | 1983 | 1701 | .85 |
| 3 | 2007 | 1665 | 1.20 |
| 4 | 1751 | 1650 | 1.06 |
| 5 | 1646 | 1575 | 1.04 |
| 6 | 1903 | 1866 | 1.01 |
| 7 | 1512 | 1652 | .90 |
| 8 | 1676 | 1625 | 1.03 |
| 9 | 1675 | 1750 | .95 |
| 10 | 1586 | 1728 | .91 |
| 11 | 1655 | 1662 | .98 |
| 12 | 1656 | 1665 | .99 |
| 13 | 1778 | 1750 | 1.01 |
| 14 | 1910 | 1705 | 1.12 |
| 15 | 1810 | 1790 | 1.01 |
| 16 | 1639 | 1538 | 1.00 |
| Average | 1709 | 1710 | 1.00 |

The determination of the capacity of the stomach is a matter of considerable interest, from the fact that it is really, so far as we know, the only means by which it is possible to differentiate with any degree of accuracy between dilatation and prolapse of the stomach. Various means have been proposed whereby the position of the lower border of the stomach may be determined with more or less accuracy. The most precise methods with which the writer is familiar are the two which have been briefly described in this journal, and which he believes are original with himself. One of these methods is adapted to persons with a moderate amount of flesh; the other, to very fleshy persons. Briefly stated, these methods are as follows: —

1. *The Method of Determining the Position of the Lower Border of the Stomach Adapted to Thin or Moderately Fleshy Persons.* — The patient lies upon the back with the head raised by a pillow of moderate thickness. The knees are well drawn up and the feet supported on the table, so that the abdominal muscles are as perfectly relaxed as possible. The physician stands at the patient's right, placing his right hand against the patient's right side, and his left hand upon the opposite side of the abdomen. Slight movements are made similar to those employed in palpating the abdomen in ascites, or in the examination of a cyst, except that a little more vigor is used, the purpose being to agitate the fluid contents of the hollow viscera, if any of them happen to contain fluid at the time of the examination.

The whole abdomen is gone over somewhat rapidly in this manner. If fluid and air or gas are present in the stomach or colon, splashing or succussion sounds — so-called *clapotement* — are heard. This examination should be made, if possible, about four or five hours after the patient has eaten, and after the bowels have been evacuated, so that the stomach and colon may be found as nearly empty as possible. As a rule, no sounds will be produced by this sort of manipulation unless the patient

has swallowed a quantity of liquid shortly before the examination, or is suffering at the time from looseness of the bowels. All these conditions must be kept in mind, and possible errors therefrom taken into account after each examination.

If no sound is heard, the patient is made to drink one glassful of water, and the examination is repeated, the left hand working up and down the left side from within a handbreadth of the lower border of the ribs to an equal distance below the the umbilicus, and passing back and forth across the abdomen so as to oppose the movements made by the right hand in various directions and in various positions, the impulses made by the right hand being constantly directed toward the left hand while changing its position. The purpose in this is not only to produce a sound,— the so-called *clapotement*, or succussion sound,— but at the same time to catch within the left hand the fluid-wave set in motion by the right hand. A person who has a delicate sense of touch will have no difficulty in discovering instantly the impulse resulting from the movement of the liquid in the stomach, and by changing the position of the hand the lower border of the stomach may be quickly outlined.

Then, by changing the relative positions of the two hands, the examination may be extended to the right side. Very reliable information may also be obtained from the sound of the succussion wave, it being located by means of a stethoscope placed against the abdomen and moved up and down parallel with the median line of the body while the movements of the right hand are being executed as above described. The stethoscope, however, does not give as accurate information as does the impulse communicated by the wave of liquid to the well-trained fingers.

2. *The Method Applicable to Very Fleshy Persons.*— The writer has devised a plan which was first described at a meeting of the American Medical Association held at Baltimore, in 1895, whereby the position of the stomach may be determined in very obese persons, by means of a sound. This sound carries at its distal end a peculiarly constructed electrical buzzer, which is set in operation by small wires carried through the sound and connected with an alternating current apparatus. This sound, which is nothing more than an ordinary stomach-tube with an electrical device added, is introduced into the stomach in the ordinary way, the position of the lower end of the tube being, by means of the stethoscope, easily determined by the sound made. If the tube is flexible, it bends when it reaches the lower border of the stomach, and glides along the greater curvature, thus giving a very accurate idea of the position of the lower border of the stomach.

These two methods are, so far as the writer knows, the only exact and accurate ones by which the position of the lower border of the stomach can be positively determined. They do not, however, give satisfactory information concerning the position of the upper border of the stomach, and hence do not enable us to determine with any degree of exactitude respecting the size or capacity of the stomach. Information upon this point has hitherto been lacking, although its importance is very evident.

In a previous paper the writer has accurately described a chemical method developed by him, whereby it is possible to determine with as great a degree of exactness as could be desired, the capacity of the stomach. The details of this method it is not the design of this article to repeat, the reader being referred to the one which appeared upon this subject in the July number (1896) of this journal. The present purpose is simply to give the figures obtained in a number of healthy individuals, as shown in the

accompanying table (page 279), and to call attention again to the interesting fact that the normal stomach capacity is 1. c.c. for each millimeter of height.

It is evident that the capacity of the stomach must vary with the size of the individual. Weight and breadth are somewhat variable quantities, being dependent upon the amount of adipose tissue present. Height, however, is a fixed quantity; hence this is chosen as the unit of comparison. In referring to the table given, it will be noticed that in the sixteen healthy persons examined, all of whom were young men between the ages of twenty and twenty-five, the average capacity of the stomach was 1709 c.c., while the average height was 1710 millimeters. Dividing the capacity of the stomach in cubic centimeters by the height in millimeters, we have 1.00.

In examining the figures for individual cases, it is interesting to note that there are no very extreme departures from the normal proportion of 1 c.c. of stomach capacity to each millimeter in height; the figures are practically at the normal standard, nine cases being from six to twenty per cent. above, and three cases from ten to fifteen per cent. below. From these figures it seems to be apparent that the examination of a very large number of normal cases would not materially change these results; hence we feel justified in claiming the establishment of a new fact in physical proportion; viz., a definite relation between the capacity of the stomach and the height, which may be employed as a normal standard for comparison. In a future paper we shall publish some interesting observations which have been made respecting departures from the normal standard in both directions.

## REPORT OF EXAMINATION OF BLOOD.

FOR OCTOBER.

| Blood Count. | Men. | Women. | Total. |
|---|---|---|---|
| Over 5,000,000 | 5 | 1 | 6 |
| Between 4,500,000 and 5,000,000 | 23 | 18 | 41 |
| " 4,000,000 " 4,500,000 | 27 | 41 | 68 |
| " 3,500,000 " 4,000,000 | 1 | 6 | 7 |
| " 3,000,000 " 3,500,000 | 4 | 1 | 5 |
| " 2,500,000 " 3,000,000 | 1 | 3 | 4 |
| Totals | 61 | 70 | 131 |

| Hemoglobin. | Men. | Women. | Total. |
|---|---|---|---|
| 100 per cent. | 22 | 24 | 46 |
| 93 " " | 30 | 41 | 71 |
| 85 " " | 6 | 2 | 8 |
| 65 " " | 2 | 3 | 5 |
| 57 " " | 1 | | 1 |
| Totals | 61 | 70 | 131 |

**Gastric Laboratory Report for October.**— Total number of analyses, 111; regular analyses, 99; experimental, 12.

The regular cases were from the following States and countries: Michigan, 39; Illinois, 13; Ohio, 10; Indiana, 7; South Dakota, 3; New York, 3; Iowa, 3; Kansas, 2; Wisconsin, 2; Missouri, 2; Minnesota, 2; Vermont, 2; Kentucky, 1; Colorado, 1; New Jersey, 1; Pennsylvania, 1; Tennessee, 1; Georgia, 1; Wyoming, 1; Texas, 1; Canada, 1; New Zealand, 1. Total, 99.

**Sputum Examinations for October.** — There were 30 examinations made, 25 of which were new cases. Tubercular bacilli were found in 6 cases, 4 of which were new.

**Bacteriological Examinations of Stomach Fluids for October.**— Total number of examinations made was 112, 9 of which were experimental.

**Urinary Laboratory Report for October.**— Number of specimens examined, 290; number of cases, 169. Number of cases with albumen, 17; sugar, 3; blood, 8; pus, 43; bile, 3; casts, 6.

# PUBLISHERS' DEPARTMENT.

WE take pleasure in calling attention to the brief description of the Colorado Sanitarium given in this number. This institution has been established especially for the purpose of giving persons suffering from pulmonary consumption a better chance for their lives than they have heretofore had. The general incurability of this disease, under ordinary conditions, is a fact so well recognized that it is not necessary to emphasize the importance of sending patients of this class to an elevated region. To seek an elevation of a mile in height has heretofore been the best possible prescription for a consumptive.

But climatic change is not the only thing needful, and for many cases other advantages are absolutely essential to recovery. Many have died under excellent climatic conditions who might have recovered, had they received the advantage of proper instruction respecting diet and exercise, and could they have had the advantage of baths scientifically administered, massage, Swedish movements, carefully graduated gymnastics, etc.

The institution established at Boulder is equipped with every possible facility for the successful treatment of chronic invalids of all classes, as well as for the management of cases suffering from diseases of the lungs. It is not a money-making concern, the entire proceeds of the work of the institution being devoted to the enlargement of the institution, the improvement of facilities, and the treatment of persons in indigent circumstances.

It is more than probable that nine tenths of the two hundred thousand persons who die of consumption each year in the United States might be saved by the advantages afforded by a well-equipped sanitarium in the Rocky Mountain region. The results which have already been obtained in this institution since its small beginning three years ago, and especially by the aid of its present enlarged facilities, may be fairly said to be unprecedented. We are glad to be able to report that the institution is already in a very prosperous condition, having scores of patients under treatment; but there is still room for more.

Physicians having cases requiring climatic change and sanitarium treatment, whether suffering from pulmonary or other chronic disorders, should look into the advantages of this institution before leaving their patients to die at home. Full information may be obtained by addressing the superintendent of the Colorado Sanitarium, Dr. W. H. Riley. Dr. Riley's name is already familiar to the readers of MODERN MEDICINE as a frequent contributor to its columns, and his long experience in connection with the Battle Creek Sanitarium has admirably qualified him to conduct the work at Boulder in a thoroughly efficient and scientific manner.

---


# The Art of Massage

## Its Physiological Effects and Therapeutic Applications.

BY J. H. KELLOGG, M. D.

THIS work is eminently condensed, concise, practical, and covers the whole ground in a manner which the publishers believe will commend itself to all who are competent to judge of its merits. After a brief sketch of the History of Massage, and an outline of the parts especially concerned in Massage, the author gives in twenty pages an exceedingly lucid statement of the physiological effects of Massage, in which the subject is brought up to the latest date. The following chapter is devoted to the Therapeutic Applications of Massage, in which the general indications are clearly pointed out.

***CONCISE DIRECTIONS ARE GIVEN FOR MORE THAN 40 MANIPULATIONS.***

Fifty pages are devoted to the several procedures of Massage, which are considered under seven heads; namely,

TOUCH, FRICTION, VIBRATION,
STROKING, KNEADING, PERCUSSION,
JOINT MOVEMENTS.

Under these several heads more than forty different forms of manipulation are described, care being taken to eliminate all procedures which are of no real practical value. **A number of new procedures not previously described in any text-book, but which are of great practical value, are described.**

**Every Procedure is Illustrated by Half-Tone Engravings from Original Photographs. Forty-five plates; one hundred and thirty-nine cuts. Ten beautiful colored Anatomical Plates. The only Complete, Practical, and Fully Illustrated Treatise on the Subject.**

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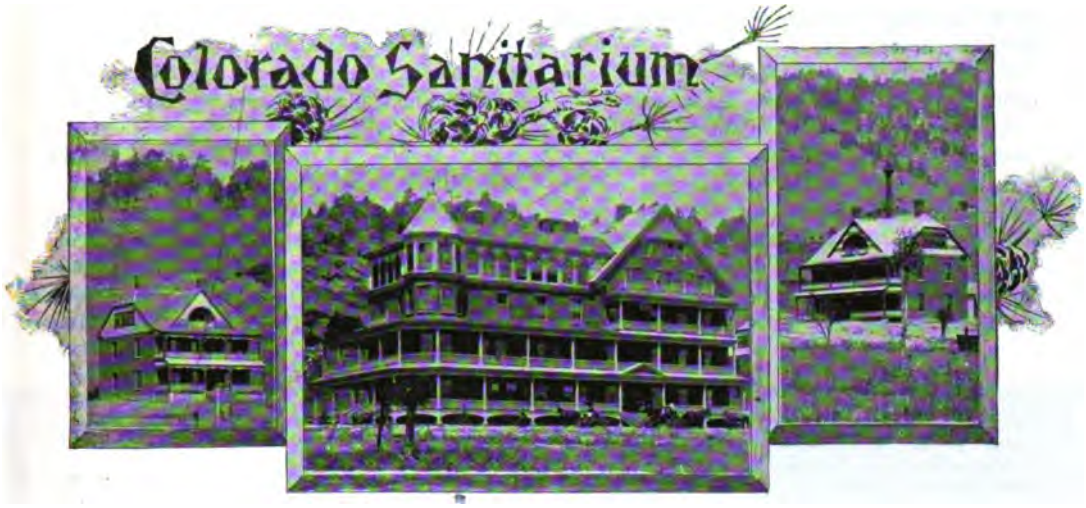


## ORIGIN.

WITHIN the last ten years, the necessity for the treatment of certain classes of invalids in properly equipped sanitariums has been thoroughly recognized by the foremost and most conservative members of the medical profession ; and the need of an institution of this sort located somewhere in the Rocky Mountain region, to which physicians could send their patients, with confidence that they would receive kind and intelligent care and scientific treatment, instead of being subjected to the hardships and inconveniences of the ordinary hotel or boarding-house, has frequently been discussed at the annual meetings of the American Climatological Association and various other medical bodies.

For more than twenty years the managers of the Battle Creek Sanitarium have been sending certain classes of patients, particularly cases of consumption, to various points in the Rocky Mountains, to give them the benefit of the well-known climatic advantages of this portion of the United States. The excellent results observed in these cases, under conditions not in all respects the most favorable, have led to the belief that if to this climate could be added the advantages of such care, regimen, and training as are afforded by a first-class sanitarium, still greater and better results might be obtained, and for several years the philanthropic association which thirty years ago established the Battle Creek Sanitarium, has been investigating the merits of the various localities in the Rocky Mountain region, from Wyoming to Old Mexico.

## LOCATION.

When it became generally known that the establishment of such an institution in the Rocky Mountain region was contemplated, the promotors were overwhelmed with letters from all parts of this great region, setting forth the special merits of various localities, some of which are already well known to the public, and others which have been less generally advertised.

The leading localities were personally visited by the president of the board, or by special committees appointed for the purpose, and careful comparison made of the respective merits of the various points brought forward for consideration.

In the selection of a locality, special attention was given to the following points : —

1. Altitude. Experience has shown that the altitude of an institution of this sort should be about one mile, or a little more than five thousand feet.

2. Equability of temperature. This required a location near the foot-hills, to avoid, on the one hand, the excessive summer heat of the plains, and on the other, the trying blizzards of winter.

3. Scenic advantages, as a sort of entertainment, and an inducement to exercise and rec reation.

4. A location easily accessible, with not too precipitous mountainsides, so as to afford opportunity for exercise in climbing carefully graduated paths on foot or horseback.

5. Ready accessibility by rail.

6. Close proximity to a city, to secure the advantages of an organized community.

7. Protection from the high winds which prevail at certain seasons of the year in mountainous regions.

8. A sterile or non-infected soil, and a locality free from tubercular disease.

Numerous localities were found which supplied two or three of these desiderata, but it was not an easy task to find a single locality presenting in a high degree all these important features. After a long, patient, and expensive investigation, the committee appointed for the purpose of opening this new enterprise finally fixed upon the vicinity of Boulder, as, on the whole, the most desirable location in the entire Rocky Mountain region.

The committee was assisted in making its selection by the fact that it was found that a large proportion of the patients recommended by the Sanitarium management to visit the Rocky Mountain region, sooner or later, without special recommendation or concerted action, found themselves at Boulder; so that, after a time, there was to be found in that city quite a large colony of these exiles. The colony continued to grow until a demand was made for a boarding-house, where proper diet and nursing could be secured. A considerable number of the citizens of Boulder joined with the invalids in this request, and three years ago, a so-called sanitarium boarding-house was opened in a building hired for the purpose. This little institution soon outgrew its small quarters, making it necessary to hire several additional cottages; and in a year the number of invalids so increased that a physician was demanded and supplied. Within a month it became evident that much larger provisions must be made for the accommodation of the large number of invalids who were applying to them for care and treatment.

**Dining-Room.**

The committee having selected the site now occupied by the Colorado Sanitarium, it was purchased, and steps taken for the erection of suitable buildings. The Eastern friends of the enterprise contributed about sixty thousand dollars for this purpose.

First of all, two fine, large, three-story, brick, steam-heated cottages were erected. While the main building was in process of erection, these were quickly filled; and as rapidly as rooms could be finished off in the main building, they were also filled with patients, so that at the dedication, July 1, 1896, there were very few vacant rooms in either main building or cottages.

Thus it will be seen that the Colorado Sanitarium is the natural outgrowth of circumstances indicating a real and positive demand.

Colorado has a world-wide reputation as the Switzerland of America. Its Alpine peaks, its picturesque gorges and cañons, are scarcely surpassed even in Switzerland, while its climatic advantages are vastly superior to those of the Little Republic. The dryness and purity of the air, with the almost perpetual sunshine, have saved the lives of thousands who to-day testify by their active usefulness to the virtues of this wonderful climate.

success of the measures employed sufficiently great, to furnish foundation for the statement that by the combination of the climate with sanitary advantages, the proportion of cures can be greatly increased.

The institution is not, however, wholly devoted to the treatment of consumptives. It is, like the various other institutions of the same character which have been established under this management, not a money-making enterprise, but a self-supporting philanthropy. The entire profits from the work of the institution will be forever devoted to the improvement of facilities and the treatment of the worthy sick poor.

**One of the Parlors.**

The special purpose of the promoters of the Colorado Sanitarium has been to establish an institution at which chronic invalids, especially those suffering from pulmonary tuberculosis, or consumption, may secure the best possible advantages in the recovery of their health,—advantages by the aid of which complete recovery may be expected in nearly all cases in which the disease is still in its incipient stages, and even in a great majority of those in which the malady has made considerable advancement. During the few years which have elapsed since the small beginning of this institution, the number of patients treated has been sufficiently large, and the

The city of Boulder is situated a little north of the center of the State of Colorado, twenty-nine miles by rail from the city of Denver, at the entrance of the famous Boulder cañon and two other fine cañons. It is near the far-famed Estes Park, and is surrounded by numerous beautiful mountain lakes, which abound in this region as in no other part of Colorado. It is supplied with an abundance of the purest water, from never-failing sources in the snow-capped peaks.

The Sanitarium buildings are located just in the edge of the city, upon a site of one hun-

dred acres, consisting of two distinct portions, — a gently sloping hillside, and a splendid mountain with peaks and crags and strange, fantastic geological formations resembling those of the far-famed Garden of the Gods. The surroundings are the grandest to be found in Colorado. Lofty mountains tower up almost from its very doors, and the invalid may, in a day's travel up the sides of these mountains, find all the varied climates, from the temperate zone to the Arctic circle. Beautiful cañons and streams of mountain water are on every hand, and this, too, within an hour's ride of Denver, the metropolis of the Rocky Mountain region.

**A Private Room.**

## BUILDINGS.

The main building of the institution is one hundred feet in length, and sixty-six feet in width, with a large rear extension. It is constructed with special reference to its use as a sanitarium, thoroughly ventilated, heated by steam and open grates, lighted by electricity, supplied with elevators, electric call-bells, and all modern hotel conveniences. A unique feature is the location of a large, sunny parlor and a capacious dining-room at the top of the building. The kitchen is also located at the top, so that the building is absolutely free from kitchen smells. The drainage and sewerage are perfect, and careful attention has been given to the maintenance of thoroughly aseptic conditions. Altogether, it is believed to be the most perfect structure ever erected for the purpose for which it is designed.

## METHODS.

The methods of treatment employed in the institution are such as have been thoroughly tried, and have proved their efficiency in the successful treatment of thousands of cases of chronic disorders in the other institutions conducted under the same general management as the Colorado Sanitarium.

The physicians who are connected with the institution are men and women who have been regularly educated in the best medical schools of the country, with the additional advantage of post-graduate training, and who have had a broad experience in sanitarium work. The medical work of the institution is conducted in harmony with the ethics of the profession, and on strictly scientific principles.

## TREATMENT APARTMENTS.

There are two sets of treatment apartments, one for ladies and one for gentlemen ; medicated-air rooms, and other departments for special treatment in all the different lines of medicine. All forms of baths are given, including the electric-light bath, massage treatment, manual Swedish movements, and electricity in every form. In the medicated-air rooms those suffering with bronchial, asthmatic, and other lung troubles can live, if necessary, in an atmosphere particularly adapted to their condition,— an arrangement which affords one of the very best means of medication in all classes of diseases of the respiratory organs.

**Throat and Lung Department.**

## DIETARY.

In the treatment of all forms of chronic disorders, careful attention to the nutrition of the patient is of fundamental importance. This is emphatically true of those who are suffering from disease of the lungs in any form. Without doubt many cases of pulmonary consumption begin, and are aggravated after the disease is established, by disorders of the stomach and digestive system. The preparation of food and the regulation of diet in each case are matters which receive first attention at the Colorado Sanitarium.

## PHYSICAL TRAINING.

The institution is provided with a commodious gymnasium, where, under a trained director, each patient is put through a course of training for the purpose of increasing his breathing capacity, strengthening his heart, and developing his muscular system generally. This forms an important part of the daily program of the average patient. Other cases which seem to need it are put upon the rest-cure, with appropriate treatment.

## MEDICAL DEPARTMENTS.

Although the prime purpose in the organization of the institution was to provide an establishment in which persons suffering from pulmonary ailments might enjoy, together with the best climatic advantages, the benefits to be derived from all the resources of modern medical science, the management wish it to be distinctly understood that the work of the institution is not exclusively confined to this class, but that the most superior facilities are af-

forded for the treatment of all classes of chronic ailments. Special departments are maintained for the treatment of diseases —

Of the nose, throat, and lungs.

Of the digestive system.

Peculiar to women.

Of the nervous system.

Of the eye and ear.

Persons with incurable diseases and those which cannot be promptly associated with other patients are not received. The location of the institution has been especially selected with reference to the freedom of the soil and air from infection; and the strictest rules and precautions are observed with reference to the maintenance of this condition. Through the neglect of such precautions, localities once free from tubercular germs have become so thoroughly infected as to cause infection of the well, as well as the reinfection of those who have once recovered. Persons who decline to observe the rules and precautions considered essential are not allowed to remain in the institution.

## SURGICAL DEPARTMENT.

In addition to the foregoing, the institution includes a well-appointed surgical ward, with modern appliances, and trained nurses, where thorough asepsis is carried out.

The departments of medical and surgical work are under the supervision of physicians who have had ample preparation for, and a broad experience in, their several lines of work.

## LABORATORY OF HYGIENE.

Connected with the sanitarium is a laboratory of hygiene, where bacteriological, microscopical, and chemical work is carried on according to the most approved methods. In this laboratory, examinations are made of the blood and urine of every case which applies for treatment, as an important aid in diagnosis, and bacteriological examinations are made of the sputum of all cases that expectorate.

## SOCIAL LIFE.

The social life at the sanitarium is wholesome and cheerful. All connected with the institution as employees are believed to be Christian men and women, and conscientious in their efforts to relieve the suffering. An atmosphere of good cheer and contentment pervades the institution.

## RATES.

The rates are moderate, varying from $1.75 to $4 a day for board, room, and general treatment, with bath attendant and medical attention. A moderate extra charge is made for special nursing and for office treatment.

General examination, $5.

For further information, address

W. H. RILEY, M. D., SUPT.,

Or, COLORADO SANITARIUM,

BOULDER, COLO.

# DIRECTORY OF SANITARIUMS.

THE following institutions are conducted under the same general management as the Sanitarium at Battle Creek, Mich., which has long been known as the most thoroughly equipped sanitary establishment in the United States. The same rational and physiological principles relative to the treatment of disease are recognized at these institutions as at the Battle Creek Sanitarium, and they are conducted on the same general plan. Both medical and surgical cases are received at all of them. Each one possesses special advantages due to locality or other characteristic features.

## ST. HELENA SANITARIUM, OR RURAL HEALTH RETREAT,

ST. HELENA, CAL.

W. H. MAXSON, M. D., Superintendent.

IRVING E. KECK, Business Manager.

THIS institution is beautifully located at the head of the Napa Valley. It is a fine large building, with excellent appointments, and all facilities required for the treatment of chronic invalids of all classes. It has also a record for a large amount of successful surgical work. There are several able physicians connected with the institution. The scenery is delightful, the climate salubrious; the water supply, which is furnished by mountain springs, is pure and abundant. Hundreds of cases of diseases generally considered incurable have been successfully treated at this excellent institution during the twenty years of its existence.

## CHICAGO SANITARIUM,

28 COLLEGE PLACE, CHICAGO, ILL.

THIS institution is a branch of the Battle Creek (Mich.) Sanitarium. It is favorably located near Lake Michigan, in the southern portion of the city, close to Cottage Grove avenue, and facing the old Baptist University grounds. A few patients are accommodated. Facilities are afforded for hydrotherapy, and the application of massage, electricity, Swedish movements, and other rational measures of treatment.

## NEBRASKA SANITARIUM,

COLLEGE VIEW (LINCOLN), NEB.

A. R. HENRY, President.

A. N. LOPER, M. D., Superintendent.

COLLEGE VIEW is a thriving village located in the suburbs of Lincoln, with which it is connected by an electric railway. College View is the seat of Union College, one of the leading educational institutions of the West. The Sanitarium has a beautiful location, facing the spacious college grounds, and gives its guests the advantages of a quiet, homelike place, combined with appropriate and thoroughly rational treatment. It has a full equipment of excellent nurses, and has already won for itself an enviable reputation in the West.

## PORTLAND SANITARIUM,

PORTLAND, ORE.

L. J. BELKNAP, M. D., Superintendent.

THIS institution is beautifully located in the center of the city, in a fine building with spacious grounds; and although it has been in operation scarcely more than a year, it already has a good patronage, and has evidently entered upon a successful career. Facilities are provided for the dietetic and medical treatment of chronic ailments of all kinds. The advantages for treatment include, in addition to various forms of hydrotherapy, electric-light baths, and apparatus for the application of electricity in its various useful forms, manual Swedish movements and massage.

## COLORADO SANITARIUM,

BOULDER, COLO.

W. H. RILEY, M. D., Superintendent.

THIS institution is located on a beautiful site of one hundred acres, including a fine mountain peak, and commanding extensive landscape views which, for variety and beauty, can hardly be equaled. The site adjoins the thriving city of Boulder, and is about one hour's ride by rail from Denver, the streets and principal buildings of which are easily discernible from the peaks around Boulder. The equipment consists of a large building especially erected for the purpose, two fine cottages, and every appliance for the application of hydrotherapy, and for the special treatment of pulmonary ailments, to be found in the best establishments of like character. Particular attention is given to the dietetic treatment of patients, and to systematic exercise, in addition to the special treatment for specific ailments. The altitude is between five and six thousand

# Directory of Sanitariums.—Continued.

feet, just that which has been determined to be the best for pulmonary troubles. Though but a few months have elapsed since the work of this institution was fairly begun, a large number of persons suffering from pulmonary tuberculosis have already been cured, and are now rejoicing in sound health. The rational hygienic treatment, with the climatic advantages, has proved effective in the cure of cases which, without the combined advantages of these superior measures, must certainly have succumbed to the disease.

## GUADALAJARA SANITARIUM,

STATE OF JALISCO, MEXICO.

D. T. JONES, Superintendent.

ADDIE C. JOHNSON, M. D.,
J. H. NEALL, M. D., } Physicians.

THIS institution, established in 1894, is the first and still the only one of the kind in Mexico. It affords, in addition to the unsurpassed climatic advantages of the region in which it is located, facilities for the employment of hydrotherapy, electricity, massage, manual Swedish movements, and dietetics, in the treatment of all forms of chronic disease. The altitude is the same as that of Denver,—from five to six thousand feet. Guadalajara has the advantage of a climate more nearly uniform than any other with which we are acquainted. Located in the tropics, it enjoys almost perpetual sunshine, while its altitude is such as to prevent excessive heat. There is probably no better place on earth for a pulmonary invalid. It is only necessary that the advantages of this institution should become known to secure for it extensive patronage.

## INSTITUTE SANITARE,

BASEL, SWITZERLAND.

THIS institution affords the only place in Europe where patients can receive the advantages of a thoroughly hygienic diet, baths, electricity, Swedish movements, massage, and various other methods of treatment, applied after the manner and in accordance with the same principles which govern the Battle Creek Sanitarium and its several branches. The physicians are persons who have received a thorough training in the institution at Battle Creek. Terms are moderate. No better place for sick persons or semi-invalids abroad than the Institute Sanitare.

Address, 48 Weiherweg.

# The Surgical Home,

## A PRIVATE HOSPITAL

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Formerly Professor of Surgery in the Kansas City Medical College and Professor of the Principles and Practice of Surgery in the St. Louis College of Physicians and Surgeons.

**FOR THE TREATMENT OF ALL SURGICAL CASES AND DISEASES OF WOMEN.**

NICE building, well heated and ventilated, situated in a quiet part of the city. Each patient has a private room and perfect seclusion. No cases of infectious diseases are received and the number of cases is limited. Physicians desiring to send patients to the city for special treatment are assured that every possible comfort and the most skillful nursing and care will be given, and at reasonable rates. Telegrams, letters and patients for the hospital should be directed to the *residence* of **EMORY LANPHEAR, M. D.,**

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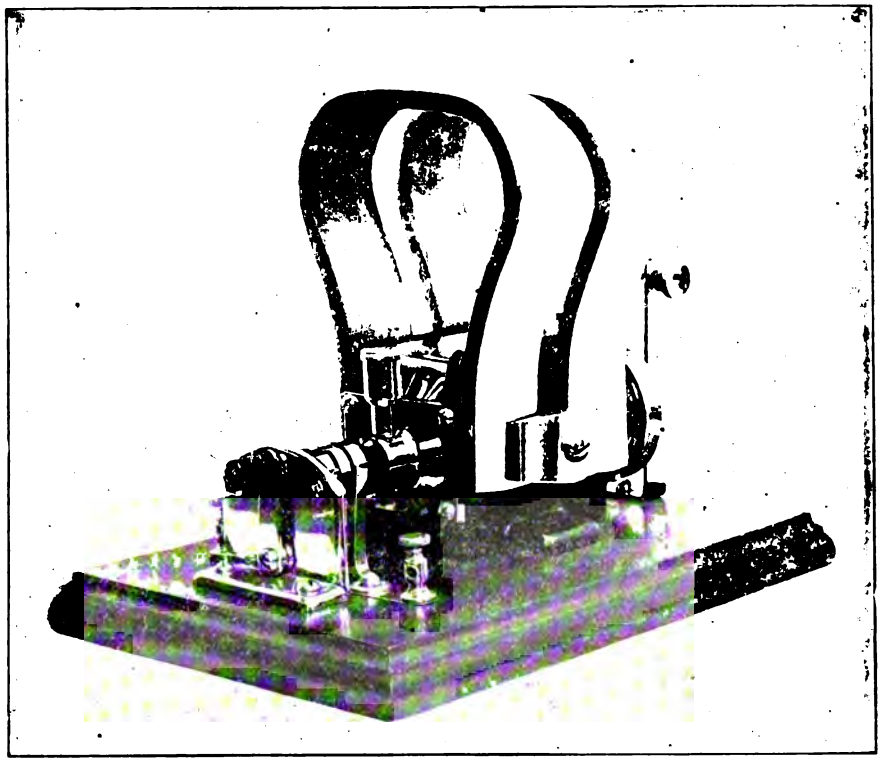

# NEW SINUSOIDAL APPARATUS.

◆ ◆ ◆ ◆ ◆

THIS apparatus is extremely convenient in use. It is **always ready for business,** and the several different currents can be obtained by simply moving a switch, and without adjustment of the conducting cords.

Its large capacity is shown by the fact that **it will light an ordinary 16 C. P. electric lamp.**

It is provided with a **perfect speed regulator,** and the current is controlled by a simple rheostat, as any other electrical current.

This apparatus, which is now for the first time made available to the members of the profession, is furnished in the following styles and combinations :—

Sinusoidal apparatus with permanent magnets; hand motor, consisting of a crank with grappling pulley and plate mounted on wooden base; electric motor to be run with two Edison or storage cells; electric motor, to be operated by ordinary incandescent current 100 to 110 volts or with 50 volt current from transformer or an electric street-car system; water motor; sponge rhesotat, convenient and indestructible.

Some sort of motor is of course required to operate it. Any of the above motors will be found satisfactory, but the most satisfactory arrangement of all is, of course, the electric motor, operated by an electric-light system, which is constant and always ready for use.

The sinusoidal machine can now be promptly furnished without motor, or with any of the different motors named above, carefully boxed and delivered at the express office. A full set of directions is sent with each apparatus.

For circulars and prices address,

**THE SANITARY AND ELECTRICAL SUPPLY COMPANY,**

**Battle Creek, Mich.; or 28 College Place, Chicago, Ill.**

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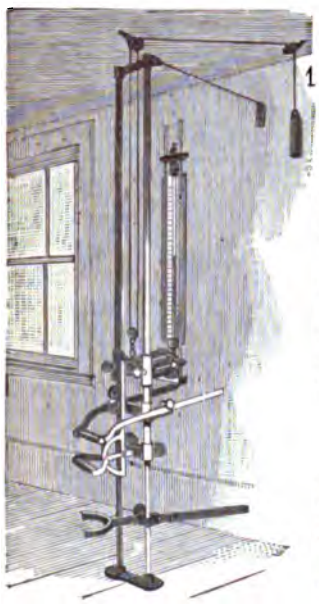

The accompanying cut represents **Dr. Kellogg's Universal Mercurial Dynamometer**

## Specially Adapted to Testing the Strength of the Individual Groups of Muscles in the Human Body.

Every important group of muscles in the body can be tested with this instrument, numbering twenty-five in all, counting only one side of the body.

This instrument furnishes the basis for a scientific study of muscular dynamics. By the aid of the percental charts which have been constructed from it, and which accompany the instrument, it is possible to make a graphic representation of the muscular capacity of an individual such as cannot be obtained in any other way, thus

## Furnishing Accurate Data upon which to Base a Prescription for Exercise,

The lack of which, up to the present time, has been the greatest obstacle in the way of the scientific application of gymnastics to the correction of deviations from the normal standard of symmetry.

For further information concerning this instrument and the value of the data furnished by it, address,

SANITARY AND ELECTRICAL SUPPLY CO., Battle Creek, Michigan.

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*Gen'l Superintendent,*
*DETROIT.*

***O. W. RUGGLES,***
*Gen'l Pass'r and Ticket Agent,*
*CHICAGO.*

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# Bromose

## Makes Fat and Blood.

**BROMOSE,** an exceedingly palatable food preparation, consists of cereals and nuts, in which the starch is completely digested, the nuts perfectly cooked, and their fat emulsified. It is thus ready for immediate assimilation. It is the most easily digested and most fattening of all foods, and at the same time rich in proteids, and hence **UNEQUALED AS A TISSUE BUILDER.**

**BROMOSE** makes fat and blood more rapidly than any other food. It is the food par excellence for blood, brain, and nerves. Invalids whose troubles are due to the fact that they cannot digest the starch of cereals and vegetables, find in **BROMOSE A PANACEA.**

**BROMOSE** is rich in salts, as well as proteids and food elements. It is excellent for invalids who are thin in flesh, those who cannot digest starch, old people, feeble infants, consumptives, convalescents, fever patients, neurasthenics, and those who wish to **gain in flesh.**

**SANITAS FOOD COMPANY,**

**Battle Creek, Mich.**

# Battle Creek (Mich.) Sanitarium

# Health Foods.

EAT GRANOLA
GRANOSE
DRINK CARAMEL
CEREAL

ESTABLISHED 1876.

## FOOD CURE FOR CONSTIPATION.

AN inactive state of the bowels is one of the most common causes of many serious maladies. Chronic headache, biliousness, hemorrhoids, backache, and perhaps more serious constitutional ailments, may be readily attributed to habitual constipation.

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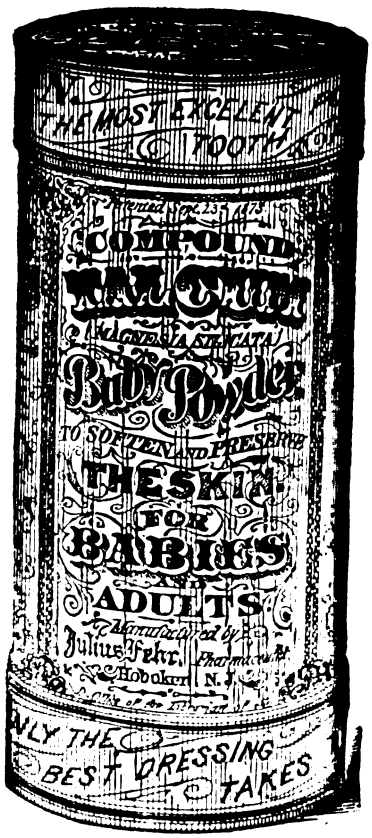


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| a m | p m | p m | | | | p m | p m | p m | | a m |
| 9.00 | 5.02 | 8.15 | a m | ..... | ....D. Chicago. a..... | 6.30 | 2.00 | 9.10 | ..... | 6.30 |
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| p m | | | | | | | | | | |
| 1.10 | 6.15 | 12.00 | 10.05 | ..... | .....South Bend..... | 2.35 | 10.40 | 5.55 | ..... | 2.47 |
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BACTERIOLOGICAL REVIEW.

VOL. V. BATTLE CREEK, MICH., U. S. A., DECEMBER, 1896. NO. 12.

# ORIGINAL ARTICLES.

## THE NON-MEDICINAL TREATMENT OF INSOMNIA.

BY W. H. RILEY, M. D.,

Superintendent of the Colorado Sanitarium, Boulder, Colo., Member of the American Medical Association, the American Neurological Association, etc., etc.

INSOMNIA is a condition in which the individual suffers from too little or imperfect sleep, or from its entire absence for a longer or shorter time. As sleep is a function, insomnia cannot be regarded as a disease, but simply as a disorder, or symptom. It often appears as a troublesome symptom in organic diseases of the heart, blood-vessels, kidneys, brain, etc. Space, however, will not allow a detailed consideration of the subject in all its relations to these organic diseases; the remarks in this article will therefore be mainly directed to insomnia as a disordered function, without reference to its relations to gross organic diseases.

Insomnia is usually accompanied by other manifestations of a morbid condition, prominent among which may be mentioned nerve weakness and excessive nerve irritability. It is a disorder quite as difficult to manage and quite as trying to the general practitioner as any with which he has to deal; and judging from the number of hypnotics and sleep-producing remedies which are constantly brought to his notice in the advertising pages of the medical journals, his task in this direction is not at all diminishing. The increasing number of these sleep-producing drugs which are offered to the public also suggests the importance of a knowledge of how to preserve normal sleep, and of how to relieve sleeplessness, if possible, by the use of more simple and less harmful remedies.

Americans have already gained for themselves the reputation of being a nation of dyspeptics; they are fast becoming a nation of poor sleepers. Indeed, dyspepsia and insomnia are quite commonly associated in the same individual.

As sleep is the result of, or at least is attended by, those changes in the functions of the body which we have learned to call physiological rhythms, it may be proper here to divert slightly to a brief mention of physiological rhythms.

*Physiological Rhythms.*— From the fertilization of the ovum until somatic death, the body is the seat of ever-changing activity. Many of these changes of function take place in the form of waves —a period of activity followed by a period of less activity or complete rest. These alternations of activity and rest, or exacerbation and remission of function, form the physiological rhythms which are present in all, or at least nearly all, the functions of higher animal life. They are the ebb and flow, as it were, of the stream of life; yet it is only now and then that this ceaseless flux engages our attention sufficiently to rise into consciousness, and reveal to ourselves our own changeableness.

These physiological rhythms appear in cycles of time, of greater or less duration, the greatest of them being the period of growth which begins with the fertilization of the ovum and ends at maturity. Some of these rhythms appear within the cycle of a year, depending for their appearance upon the changes of the seasons; others occur monthly; and again others in periods of less duration, by far the greater number showing themselves within a cycle of twenty-four hours.

These rhythms may be regarded as natural and physiological habits which have been established mostly as the result of external conditions and forces

acting upon the organism. And as physiological habits, they are fundamental, and consequently can be changed only with difficulty, and by altering the conditions which have led to their establishment.

The most conspicuous, and I might say the most important, rhythm that appears within twenty-four hours is that of activity alternating with rest,—wakefulness and consciousness followed by sleep and unconsciousness.

In order better to understand the conditions with which we have to deal in the treatment of insomnia, it may be well to consider briefly: —

1. Some of the natural causes or conditions that produce normal sleep.

2. The changes in the functions of the body during sleep.

3. The most common causes of insomnia.

4. Some of the remedies which have proved efficient in the treatment of a large number of cases of chronic insomnia.

Let us consider the first of these subheads; viz., *some of the natural causes or conditions conducive to normal sleep.*

Normal sleep is a condition of the body with which every one is, of necessity, and by actual experience, acquainted. Yet the causes and phenomena of sleep are questions with which physiologists and philosophers have wrestled for ages, and which even at the present time are not fully understood.

Nearly all animals with highly developed nervous systems must, night after night, or day after day, or at least time after time, lay themselves down to sleep.

The causes of sleep, or at least the preliminaries to sleep, may be considered under the following heads: —

(1) Fatigue of the nervous system.

(2) Changes in the conditions of the blood.

(3) A cessation, or reduction to a minimum, of all stimuli acting upon the nervous system.

(4) An exhaustion, or tiring, of the attention.

One of the most conspicuous and characteristic properties of nerve-tissue is its irritability, or its capability of responding to stimuli which may be applied to it. It is this property of the nerve-tissue that puts man in functional relation to the outside world, and without this relation his existence would be impossible; for if all the various stimuli that are constantly acting on his nervous system were entirely withdrawn, there would be nothing to keep the machinery of the body in motion, and he would soon cease to exist.

Modern scientific investigation is rapidly disproving the older doctrine of automaticity and spontaneity of action. What may appear to be either automatic or a free act of the "will," if closely studied, will be found to be simply the result of forces and stimuli which have previously made their impression upon the sensitive nervous system; and these stimuli, starting nerve-currents which travel in the nerve-fiber toward the center of the body, are, in their passage from one nerve-cell to another, often modified, and perhaps inhibited, but finally show their effects upon the nervous system in changes in the various functions of the body.

We may say without departing far from the truth, that every nerve-current that passes centripetally into the nervous system will, sooner or later, return, passing centrifugally outward from the nerve-centers in some form as an outgoing nerve-current which may cause a muscle to contract or a gland to secrete; or again, which may modify in some way the action of the heart, etc. And so the functions of the different organs of the body are modified and changed by the action of the various stimuli which are constantly playing upon the nervous system. The nervous system is thus the medium of union between the body and the outside world. Most changes in the external conditions that in any way affect the functions of the body must do so by first acting upon the sensitive nervous system.

Physiologically the nervous system of man and also that of the higher animals may be regarded as made up of three classes of nerve-cells: Afferent cells, over whose neuron (nerve-cylinder) the incoming nerve-current arrives at the nerve-center; efferent cells, which furnish paths for the outgoing nerve-currents; and between these two, central cells which distribute the current to different parts of the nervous system, and form the connecting link between the afferent and the efferent nerve-cells. In man the number of these central cells is large, and the arrangement complicated; in the lower animals they are fewer, and sometimes

absent. This anatomical difference between the nervous system of man and that of the lower animals offers one explanation, at least, for the physiological difference which is so often strikingly apparent.

In the lower animals, in which the nervous system is simple, a nerve-current passing inward along an afferent nerve is soon reflected outward to a muscle or gland, without traveling over a central cell at all, or at least its course through central cells is short and simple; and sometimes, as in the case of the hydra or medusa, a single bipolar sensory cell affords the only path over which the nerve-current may pass from beginning to end.

But in man, where there are numerous central cells interpolated between the afferent on the one hand and the efferent on the other, the paths afforded to the incoming nerve-current are numerous, and consequently the reaction is more complicated, and often very much delayed.

As the result of response to stimuli of one kind or another, energy is liberated from the nerve-cell, and there is a change in its material composition. If a nerve-cell is stimulated mechanically, chemically, or electrically, the activity in the cell produced by such stimulation is attended with a rise of temperature, electrical variations in the nerve-cell and fiber, and the production of acid, all of which mean that energy has been set free. The passage of the nerve-current through the nerve-cell is itself a form of energy which previous to its passage was stored up in the nerve-cell as chemical potential energy, but during the discharge of the cell is transformed into kinetic energy, and liberated as a nerve-current. This discharge of energy from the cell in the form of heat, electric changes, and nerve-currents, and the transformation in the composition of the cell by which the unstable complex molecules are broken down into more stable and simpler ones, is, sooner or later, followed by changes in its structure, form, and function.

The changes in the histological appearance of the nerve-cell after prolonged functional activity, or stimulation, for some time, have been worked out by Hodge, Vas, and Mann, in the cat, dog, sparrow, and honey-bee. The results of the experimentation relating to this question show that after prolonged functional activity, or artificial stimulation of the nerve-cell, the changes in the body of the cell are as follows: —

The size of the cell becomes smaller, and its outline more irregular; the cytoplasm of the cell becomes shrunken, and often vacuolated; the nucleus and nucleoli are smaller and more irregular in outline, and stain more deeply with osmic acid than in the resting cell, while the cytoplasm stains less deeply; and the cells in the sheath which in some cases surrounds the nerve-cells are also smaller and more irregular in the stimulated cell than in the cell at rest.

These changes are illustrated in Fig. 1, where A shows the condition of the cells of the thoracic ganglia of the cat in a rested condition, and B the shape, form, and appearance of cells and nuclei after being stimulated for a period of five hours. During this interval of five hours, the nerve-cells were stimulated by electricity for fifteen minutes, and allowed to rest for forty-five minutes during each hour. The appearance of the cells at the end of these five hours is shown in B (Hodge). Hodge has shown that the above-described changes also obtain in the nerve-cell as the result of functional activity.

Such are the changes produced in the lower animals — the cat, the dog, etc. — as the result of functional activity and artificial stimulation. And although these changes have not been so clearly demonstrated in man, they are sufficiently well proved to make them applicable to him.

There are also changes in the function of the cell as the result of prolonged activity. These may be briefly mentioned as follows: The nerve-cell is less irritable, consequently responds less readily to various stimuli that may act upon it; the nerve-currents which are generated within it are weaker and less rapid in their transit; it can be readily demonstrated that the reaction time of various stimuli, such as heat, cold, light, touch, and sound, at certain periods of the twenty-four hours, when one is tired and the nerve-cells fatigued, is much greater than it is in the early part of the day, when one is refreshed by a good night's sleep, and when the nerve-cells are fully charged with energy and new matter.

In the morning, then, after a night of sufficient and normal sleep, the nerve-cell

is well stored with new matter arranged in the form of complex, unstable molecules, and recharged with chemical potential energy, which, whenever the cell is stimulated, is readily transformed and liberated in the form of heat, electricity, and nerve-currents.

As the result of continued stimulation through the day, the cell runs down, as it were, the complex molecules being broken

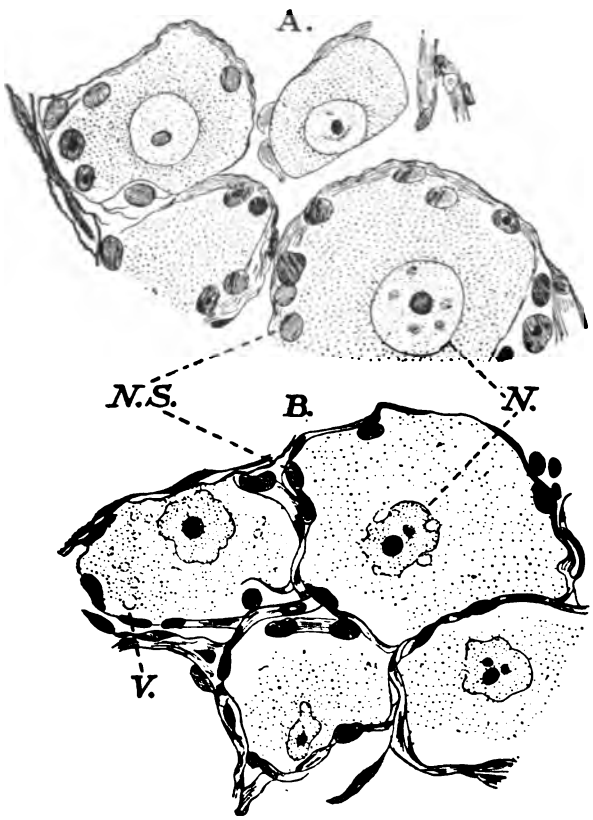


FIG. 1.— Two sections, A and B, from the thoracic spinal ganglion of the cat. B, from the ganglion which had been electrically stimulated through its nerve for five hours. A, corresponding resting ganglion. The shrinkage of the structure connected with the stimulated cells is the most marked general change. N, nuclei. N. S., nucleus of the capsule. V, vacuole. Magnified 500 diameters.— *Hodge.*

down into simpler and more stable ones; and the potential energy which is stored up in the cell is liberated and discharged in the form of nerve-currents, until at night, after a day of activity, the cell is exhausted, and must have a period of rest in which to store up new material, and recharge itself with new energy.

But within the twenty-four hours, and during the course of the running-down process, the nerve-cell may show signs of fatigue which are more conspicuous at certain intervals than at others, and therefore appear in the form of waves. The curve of fatigue attending continuous voluntary muscular contraction illustrates this fact: —

If a weight is repeatedly raised by the flexion of the forefinger, in a short time the distance through which the weight is raised becomes less and less, until there will come a time when the greatest voluntary effort will fail to raise the weight; but if the effort is continued, despite the fact that the weight does not move, the muscular contraction will finally reappear, and in a short time the weight can be raised to nearly its maximum height.

On the other hand, if a muscle is made to contract by stimulation with electricity, and without any voluntary effort, the distance through which a weight will be raised in consequence of the muscular contraction produced by the electrical stimulation is the greatest at first, and in a short time becomes less and less, and continues to decrease without any periods of returning activity until no response to electrical stimulation appears at all, and the distance through which the weight passes is not appreciable.

There is evidently a difference in the curve of fatigue produced by voluntary effort, and that produced by electrical stimulation. The waves of fatigue which appear in curves of voluntary muscular contraction indicate that at certain times weak nerve-currents are sent out from the nerve-cell as the result of its partial exhaustion.

Fig. 2 illustrates the curve produced by continuous voluntary muscular effort, and that produced by electrical stimulation of the muscle, and also shows the difference between the effect of these two forms of stimuli. The light, long lines are those for voluntary contractions; the heavy lines those for contraction following the direct stimulation of the flexor muscles by electricity; in the former there are periods, in the latter, none.

But the running-down, or discharge, of the nerve-cell, is not the only element that causes fatigue of the nervous system. This condition is hastened by the accumulation in the blood of waste products of cell activity. These substances are not eliminated as fast as they are formed in the tissues, and their retention in the blood lessens the irritability of nerve-tissue, and hastens fatigue.

Mosso found that fatigue could readily be produced in a dog at rest by injecting into his vessels blood from another dog that had been wearied by prolonged activity. Waste products that are thus produced by cell activity are not only toxic to the cells that produce them, but to other tissue with which they may be brought into contact by the circulation. Thus the waste products resulting from muscular activity may, when brought to the nerve-centers of the body, produce fatigue by their toxic influence on the nerve-cell; and our own experience tells us that the sensation of fatigue produced by mental effort is entirely different from that caused by muscular work.

The fewer the stimuli that act upon the nervous system, the more readily is sleep induced. At night, therefore, when the nervous system is fatigued, and the irritability of the nerve-cell is greatly diminished as the result of the day's activity, and when the stimulating influences of the day are largely withdrawn from the body, and the forces of nature are less active, the conditions are most favorable for sleep. It is then that we naturally withdraw from the outside world, and retire to the seclusion and quietness of our chamber for sleep. Experience tells us that we sleep better in the darkness and silence of night than in the presence of noise and light, which act as irritants to the nervous system.

Strumpbell reports an interesting case of a lad of low intelligence whose avenues of communication with the outside world had been reduced by disease to one eye and one ear. This lad could be put to sleep at will by plugging the one ear and closing the one eye.

But fatigue of the nervous system, changes in the composition of the blood, and the reduction to a minimum of the stimuli which act upon the nervous system,—conditions which we have thus far considered as causes or preliminaries to sleep,—are not always sufficient to change one from wakefulness and consciousness, to sleep and unconsciousness.

One of the necessary preliminaries to sleep is a tiring of the attention. In our usual experience of passing from wakefulness to sleep this tiring of attention occurs unconsciously. The mental images grow dimmer and dimmer; thought flows slower and slower; the attention becomes weaker and weaker, and finally is exhausted, and we pass into sleep and unconsciousness.

The tiring of attention is closely related to fatigue of the nervous system, and a reduction of the stimuli that act upon the nervous system, though this tiring of attention is not entirely dependent upon these conditions. Instances are not uncommon in which there is extreme fatigue of the nervous system, and yet the individual cannot sleep. In these cases the attention is usually active, and is the principal factor that keeps the individual awake. One of the surest ways of producing sleep is by tiring the attention, and this may often be accomplished by counting, reading dull and heavy books, listening to monotonous sounds, or keeping before the mind heavy blank verse.

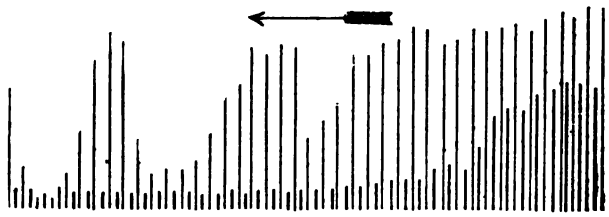

FIG. 2 represents the record of the flexions of the forefinger. The light lines are those for the voluntary contractions; the heavy lines, for those contractions following the direct stimulation of the flexor muscles by electricity. In the former there are periods of extreme fatigue; in the latter, none. The arrow shows the direction in which the curve is to be read.—*Lombard.*

(To be continued.)

## PUBLIC TURKISH BATHS NEEDED.*

BY CHAS. H. SHEPARD, M. D.,
Brooklyn, N. Y.

THE action of the New York Board of Health in appropriating thirty thousand dollars for furthering the use of antitoxin in the treatment of diphtheria, encourages the hope that in the near future the public mind may be quickened to recognize its opportunities and its necessities in other and broader fields. It is time to appreciate the fact that we are our brother's keeper, and that whatever works harm to him reacts upon ourselves. This action of the board of health also indicates

* Read in the Section on State Medicine, at the Forty-seventh annual meeting of the American Medical Association, held at Atlanta, Ga., May 5-8, 1896.

a growth in public sentiment that will encourage and sustain important measures for the public welfare. It is a moral duty as well as a principle of public polity, in all civilized countries, to protect the people from the invasion of infectious disease, and it would be very short-sighted to stop at mere infection. The use of antitoxin is only to supply a temporal exigency. It does not purify the homes of the people, or teach them to take better care of their bodies, or to make their surroundings more sanitary. Something is needed to uproot the cause of the disease; and when this is secured, it will be found that many other diseases have disappeared.

The Romans understood and perfected public sanitary works on a most stupendous scale, as is witnessed by their aqueducts for bringing pure water into the city of Rome. Some of them are in use at the present time, and the magnificent ruins of others are still standing.

In India, the home of the cholera, the city of Calcutta is now protected from epidemics of that fearful scourge by the supply of comparatively pure water, which has recently been furnished the city.

When the community can be assured of pure water to drink and pure food to eat, with proper bathing facilities, the enjoyment of life will be much enhanced and its length prolonged.

In a recent report of the Committee on National Quarantine of the New York Academy of Medicine, it was stated that "the most certain protection of this or any other country against the ravages of infectious disease lies in the practise of internal sanitation."

What is true of the state is also true of the individual. The more cleanly a man's habits, and the purer his food and drink, the less liable he is to disease, because his body is thereby rendered naturally immune to disease. Whatever our theories as to prophylactic measures in the prevention of disease, the production of a barren soil for the growth and development of pathogenic germs is of greater importance than the destruction of the germs themselves, though no effort should be spared for the elimination of all diseases. Various theories have been offered by different authorities concerning the processes and changes that take place in the body in consequence of artificial immunization, but the scientific controversy regarding it has not yet been settled. Suffice it to say, that the more pure and active the fluids of the normal living body, the more powerful are the bactericidal properties thereof.

There is at present a revival of a favorite practise of the ancients, and that is their system of bathing. The old Roman baths, which were identical with the Turkish baths of the present day, were prominent features of the daily life of the Romans, and so continued during their period of greatest prosperity. They were then carried to a scale of perfection never surpassed. The baths of Diocletian, which were the largest ever built in the world, were capable of accommodating eighteen thousand bathers at one time.

I have heretofore maintained, and would reiterate, that as one of the greatest sanitary necessities of the day, it is most desirable that large public Turkish baths, as a preventive of disease, should be established in all our cities at public expense, placed under medical supervision, with admission at nominal rates, so that the poorest individual may partake of their advantages with a feeling of self-respect in paying something for the help and comfort to be derived therefrom. They should be made attractive, and thus draw people from demoralizing enjoyments. This would react on the social life of the community, and by purifying the people would purify their homes.

We support public schools, and compel our children to attend them. With more propriety might we furnish public Turkish baths, and insist that every man, woman, and child shall avail himself of this luxury at least once a week. The physical is of greater importance than the mental; indeed, it is of the first importance to the state.

Herein would wealth have a royal opportunity to consecrate itself to the service of mankind. The endowment of public baths was among the most noble actions of the Roman emperors. Eight hundred of these institutions adorned the capital of the empire, and they supplied, during many eventful years, almost the only medicine to a people distinguished for their corporeal and mental vigor.

Among the important results that are brought about by the use of the Turkish bath may be mentioned: (1) A perfect cleansing of the external body, and relief from any undesirable odor, replacing

therefor the beauty and fragrance of health; (2) a purification of the blood by the elimination of its impurities through the surface of the body; (3) an equalization of the circulation and perfect distribution to and through every organ and tissue of the body, however remote; (4) the speedy elimination of blood poison; (5) increased nutritive changes throughout the whole body; (6) a relaxation by heat of the tissues of the body, and thereby relief of congestion, whether located in the lungs, bowels, or other organs of the body, or in the muscular tissues, as shown in the relief from rheumatism, malaria, etc.; (7) absorption of exudates and inflammatory products; (8) better ventilation of the lungs, and the placing of climatic treatment on a scientific basis; (9) greater activity of the secretions and excretions; (10) the prevention and eradication of the predisposition to disease; (11) the strengthening of every vital organ, and therefore an increase of vital capacity.

The arguments in favor of public Turkish baths are both manifold and important. To enumerate a few of them: —

They would be comparatively inexpensive.

They would lessen the cost of medication.

They would prevent the spread of epidemics.

They would render extinct many classes of disease.

They would lessen the demand for stimulants of every kind, and render the police force less necessary.

They would be more powerful than any law of prohibition, because they would be more attractive than the saloons.

They would reduce the expenses of hospitals and asylums.

They would shorten the time necessary for patients to remain in such institutions.

They would reduce the demand for hospitals, so that what are already built would be sufficient for a generation to come.

They would help toward the refinement of the community.

They would vastly prolong the average life of the people.

They would add to the enjoyment of life, by making everybody healthier and happier.

They would tend to render the cities that adopted the bath pre-eminent among all the cities of the world, and make them an example for all other cities to follow.

They would redound to the honor, and conduce to the growth, of such cities, and continually increase the numbers of the better element of their citizens.

They would uplift the community, and tend to develop a superior race of mankind, as handsome as were the Greek models, and as powerful as ever were the Romans.

To the individual the Turkish bath is the perfection of sanitary science, and to the nation it is the coming blessing.

These few reasons but imperfectly state the great need and many advantages that would accrue to the community adopting the practise of public Turkish baths.

[During the discussion which followed this paper, Dr. J. H. Kellogg made the following remarks: —]

This subject is one of very great importance. I am sure that there is nothing more valuable as a health measure than public baths. In different parts of Europe I have noticed that wherever there are public baths, the cities possess a superior class of people. On the streets of Stockholm I saw more fine-looking men, stalwart and ruddy-faced, than in any other city of Europe. There a bath can be had for five cents, or less; and for twenty-five to fifty cents, a better bath. There are different grades, so that all classes are accommodated. Connected with these baths are laundries also, where the poor people may go to wash their clothing.

Three years ago I attempted some missionary work in the way of establishing free baths in the city of Chicago. I found a place and fitted it up. There was a gospel mission next door. I asked the superintendent of the mission what he thought of the idea. He did not think it amounted to much, but I nevertheless determined to proceed with it. There was but one place in the city where a man could get a bath without paying for it, and that was in the lake — and there is a law against that.

Two or three weeks afterward this same gentleman came to me and said that he wanted to shake my hand; that the baths had changed the complexion of both the people and the community. The baths were patronized by men who were so black you could not tell to what race they belonged. I was astonished to

find how anxious the lower classes were to be clean.

One December morning, when the temperature was a little below zero, I saw one hundred and eighty men in line, the nearest one against the door, waiting to wash their bodies and clothes. There was not a man who had an overcoat or gloves. Their collars were turned up, and they were shivering in the cold. They had been there since six o'clock in the morning. It was really a pathetic sight. It is the rule to find a line like that there now every morning. Sometimes there are two hundred men standing in line waiting for a chance to get clean. I am glad to report that the city authorities, a year or two later, established, as a memorial of the late mayor, the Carter Harrison Free Baths.

I remember once hearing an anecdote at the expense of Spain. An Englishman was traveling in Spain, and going to a hotel, called for a bath. The proprietor was astonished; he could not seem to understand what was wanted. Finally the traveler learned that his host did not possess such a thing as a tub. After considerable delay, he brought two large butcher's trays, and the traveler was enabled to take his bath, presenting the appearance of a miniature Colossus of Rhodes. The result was that the water leaked through the floor upon the people below, and the proprietor ejected the gentleman from his hotel, declaring he would never have an Englishman in his house again, for they were so dirty they had to take a bath every day.

I think what is called "bogus Christianity" is chargeable with the degeneration of the public bath. One of the first things the Christians did in Rome was to tear down the baths and convert them into unnecessary churches. You will scarcely find in Rome at the present time such a thing as a public bath, only two or three floating arrangements; but there are several hundred churches, many more than are needed, which have been built almost entirely from the ruins of public baths. What this country needs is the promulgation of the gospel of health, and I do not know of anything more conducive to purity of life than ample facilities for personal cleanliness. The Turkish bath is certainly one of the best means by which cleanliness may be encouraged.

## ACTIVE AND PASSIVE EXERCISES ADAPTED TO DIFFERENT FORMS OF SPINAL CURVATURE.

BY J. H. KELLOGG, M. D.

(Supplementary to "Scoliosis," by Dr. T. J. Hartelius.)

I HAVE arranged and employed for a number of years, with excellent results, the following series of exercises in the treatment of curable forms of spinal curvature. In addition to the various Swedish exercises employed, I find it advantageous to have the patient practise daily a series of movements with the elastic-weight exercise apparatus.

### PASSIVE EXERCISE FOR PERSONS SUFFERING FROM SCOLIOSIS.

1. Lying on back, arms-sideways-raising; deep breathing, six to ten times.
2. Friction, one minute; kneading, two minutes; percussion, one minute (tapping, hacking, spatting).
3. Prone-lying, tips of fingers touching at the vertex.

*Massage to the Back.*— The patient lies upon the face, the forehead resting upon the crossed hands, the elbows well raised from the sides so as to spread the scapulæ, with the back uncovered: —

1. Centripetal friction.
2. Fulling of the neck, shoulders, sides, and loins.
3. Friction — circular, centripetal.
4. Deep kneading — palmar kneading or rolling, above the scapulæ, digital kneading, following the ribs; palmar kneading up and down the spine; digital kneading of the spine.
5. Nerve compression; spine stretching.
6. Percussion of spine and sacrum — tapping, hacking, slapping, beating, clapping.
7. Friction (alternating with kneading as above).
8. Stroking.

### GENERAL EXERCISES FOR CASES OF LATERAL CURVATURE.

*Head Flexion: —*

Standing, head backward flex sixteen times without weight.

Arm exercises with pulley-weights in opposite directions, ten to twenty times; weight, one to five pounds.

Quarter circle with pulley-weights, four to twelve times; weight, one to three pounds.

*Rings:* —

Drawing body up by the hands four to five times.

Prone-lying, trunk-raising two to six times.

Supine-lying, trunk-raising two to six times.

Supine-lying, legs-raising in alternation, two to six times.

Supine-lying, legs raising together two to six times.

Supine-lying, arms-sideways-raising, breathing, two to six times.

Rowing twelve to sixty times; weight, six to sixteen pounds.

Carrying one- to five-pound weight on head while marching.

Use of crank; pressure, ten to one hundred pounds.

POSTERIOR SPINAL CURVATURE.

1. Arms alternately upward and sideways stretching, with forward bending intermediate, three to fifteen times.

2. Neck-firm, bending to left; pressure on most prominent part of curve, three to twenty times.

3. Arms-upward-stretching, knees-bending, knees-stretching, three to eight times.

4. Prone-lying, head-backward-raising four to twelve times.

5. Arm-circumduction four to twenty-five times.

6. Neck-firm, foot-raising in alternation, six to twenty-four times.

7. Forward to backward lean, forward bending, arms-upward-stretching one to six times.

8. Prone-lying, head-raising four to twelve times.

9. Hanging by hands, head-bending-backward two to eight times.

10. Neck-firm, bending to left, with pressure on curve.

11. Forward-bending, arms-sideways-stretching, palms up, arms-forward-stretching, half-bending, upward-stretching four times.

12. Neck-firm, deep-knee-bending; breathing.

SINGLE LATERAL CURVATURE TO RIGHT.

1. Arms alternately upward and sideways stretch, with forward bend intermediate. Repeat three to fifteen times.

2. Neck-firm, bending to right, pressure on most prominent part of curve. Repeat three to twenty times.

3. Arms-upward-stretch, knee-bend, knee-stretch. Repeat three to eight times.

4. Lying on left side, bend to right one to six times.

5. Arm-circumduction four to twenty-five times.

6. Neck-firm, foot-raising in alternation, six to twenty-four times.

7. Forward-leaning, forward-bending, arms-upward-stretch one to six times.

8. Lying on left side, bend to right.

9. Hanging by hands, bending head backward two to eight times.

10. Neck-firm, bend to right with pressure on curve.

11. Forward-bending, arm-sideways-stretching, palms up, arms-half-bending, forward-stretching, half-bending, upward-stretching. Repeat one to four times.

12. Neck-firm, deep-knee-bending; breathing.

SINGLE LATERAL CURVATURE TO LEFT.

*(Right shoulder lower than left.)*

1. Arms alternately upward and sideways stretching, with forward-bend intermediate. Repeat three to fifteen times.

2. Neck-firm, bend to left, pressure on most prominent part of curve. Three to fifteen times.

3. Arms-upward-stretching, knee-bending, knee-stretching, three to eight times.

4. Lying on right side, bending to left one to six times.

5. Arm-circumduction four to twenty-five times.

6. Neck-firm, foot-raising in alternation, six to twenty-four times.

7. Forward-leaning, forward-bending, arms-upward-stretching one to six times.

8. Lying on right side, bend to left.

9. Hanging by hands, bend head backward two to eight times.

10. Neck-firm, bend to left, with pressure on curve.

11. Forward bend, arms-sideways-stretch, palms up, arms-half-bend, forward-stretch, half-bend, upward-stretch. Repeat one to four times.

12. Neck-firm, deep-knee-bending breathing.

(To be continued.)

# TRANSLATIONS AND ABSTRACTS

[THE articles in this department are prepared expressly for this journal.]

**Cancer in Belgium.**— The collective investigations on epithelioma in Belgium set on foot by the Société Belge de Chirurgie, has yielded the following results (*La Presse Médicale Belge*, July 19): The details of the 722 cases under treatment or observation on May 15 were received; of these 264 were men, and 458 women. The average age of the men was sixty-five, while that of the women was forty-five. As regards the part attacked, the breast was most frequent (one hundred and eighty-five women and two men); next came the uterus (one hundred and forty-nine, of which one hundred and thirty-three were of the cervix and sixteen of the body); then the lip (one hundred and twenty-five men and three women); the stomach and pylorus (sixty-seven men and fourteen women); the nose (twenty-eight); the rectum (nineteen men, nine women, and one boy aged fourteen); the tongue (seventeen men, three women); the liver (three men, two women); the esophagus (three men, three women); the clitoris (eight); the vulva and vagina (five); the peni and prepuce (three); the intestine (ten); the velum palati (six); the kidney (five men, three women); Fallopian tube and ovary (three). A number of single cases of cancer of the parotid, finger, toe, testicle, axilla, etc., were reported.

As regards recurrence, the observations showed that the younger the patient, the more rapid was the progress of the disease. No relation could be traced between the patient's occupation and the disease. As regards previous illnesses, special attention was directed, in the interrogatories sent out, to phlegmon, puerperal fever, and erysipelas. The following question was also asked, "Is it true that suppurative conditions are hardly ever found in the pathological antecedents of cancerous subjects?" The replies showed that in thirty-six cases there had been phlegmon, whitlow carbuncle, and suppuration; in twelve, erysipelas; in eleven, scarlet fever; in one, measles and scarlatina. Information on these points was not, however, easy to obtain, and the reporters (Gallet and Deschamps) point out that the hypothesis that suppuration creates a kind of immunity to cancer requires a much larger body of facts than is yet forthcoming to confirm it.

As regards heredity, a history of cancer among progenitors was obtained in sixty-nine of the 722 cases (less than ten per cent.). This small proportion is considered to be of some significance in view of the fact that most of those who replied to the interrogatories were general practitioners in the country, and well acquainted with the ramifications of the family trees of their patients. On the whole, the inquiry led to no conclusion as to heredity or as to the alternation of other diseases, such as tuberculosis with cancer.

As regards etiology, nothing new was elicited; moral influences and injuries were the chief causes assigned. As regards contagion, some practitioners mention the occurrence of two or three cases of cancer in the same house; one refers to the case of a woman who died of cancer after nursing a sister who had cancer of the breast; one relates a case of accidental inoculation. But on this point again the inquiry leads to no conclusion.

As regards treatment, there is no novelty. Medical treatment is unanimously pronounced to be useless; serum treatment finds little support; removal is declared to be the only way of dealing with the disease which offers hope of cure. The general outcome of the interrogatories on this head is that operative treatment may effect a cure, but that, at present, recurrence after operation is far more common than final cure.

**Influence of Hot and Tepid Baths upon the Menses.**— Matweiff (*Gazette des Hôpitaux*) has demonstrated that saline or mud baths, at 25°, 27,° or 28° C., have a favorable influence on menstruation from the point of view of pain, the quantity of blood lost, and the duration of the flow. Mirouff, who has made a number of investigations with alkaline baths at 27° or 28° C., states that they act as a sedative when taken during the menstrual period. He has found that hot baths taken by patients suffering from affections of the uterine appendages have proved of great benefit, the amount of blood lost is less, and the pain accompanying the inflammatory condition is lessened. These baths, he claims, are of real benefit both between the periods and during the flow.

**Epithelial Sowing.**— F. von Mangoldt, of Dresden (*La Semaine Médicale*), has reported a new method of skin-grafting to which he has given the name of "epithelial sowing."

The epithelium is obtained by scraping a healthy cutaneous surface. For this purpose the external or internal surface of the arm is considered preferable. The chosen spot is carefully shaved and disinfected, and then with a sharp, sterilized razor, held perpendicularly to the skin, the epidermis is scraped away until the papillary layer is reached. In this way a magma is obtained, composed of epithelial cells and extravasated blood, which is spread upon the surface to be treated, and thoroughly pressed in with a spatula. In case of a fresh wound, the sowing is very simple; but in case of an infected wound, it is necessary to remove the granulations and thoroughly disinfect.

In order to make sure that the epithelial elements adhere closely to the wound, it is advised to scarify it with a small and very sharp bistoury before spreading the scrapings upon it. The spot from which the epithelium has been taken is dusted with dermatol, covered with sterilized gauze, and bandaged. The grafted area is covered with strips of protective plaster, over which an aseptic dressing is placed.

The transplanted area during the days immediately following the operation looks as if covered with a pseudo-membrane; it loses its primitive brick-red color, and becomes yellowish-gray, a change due to coagulation of fibrin. At the fifth or seventh day the fibrin begins to disappear, and the color changes to blush-rose, the first sign of the proliferation of the epidermic elements. Towards the middle or end of the third week the surface is completely covered with epithelium. After the fifth day the dressing is changed every two days, and the wound gently irrigated with a warm, sterile, normal salt solution. After the tenth day the surface is dusted with boric acid.

**Arsenic in Cigarettes.**— As a result of his preliminary investigations of the analysis of the paper wrappings of smoking tobacco and cigarettes, Dr. William Murrell reports (*British Medical Journal*, July 11, 1896) that he has found that of the seventeen samples of tobacco and cigarette packages examined, arsenic was present in six. The presence of arsenic in the wrappers of cigarettes, he thinks, must be attended with considerable risk to the smoker, for the coloring matter easily rubs off on the fingers, especially when moist, and from the fingers on to the cigarettes. Most packet tobaccoes are put up by machinery, but the papers are spread by girls, who must of necessity in the course of their work absorb a good deal of the arsenic. The danger is both to the consumer and to those engaged in the manufacture of cigarettes, and it is by no means confined to the cheaper brands, as the poisonous substance occurs abundantly in many of the high-priced packet cigarettes.

**The Influence of Heat Applied over the Stomach upon Digestion.**— M. Pouschine (*Wratch*) has, by experiments upon six healthy persons, definitely determined the following facts respecting the influence of fomentations over the region of the stomach. The general result was to increase digestive activity. The total acidity and quantity of free hydrochloric acid were also increased; while the amount of combined chlorin was diminished. Fermentation was diminished, while the production of peptone was increased, as was also the digestive activity of the gastric juice, together with the motor functions of the stomach. The increased activity of digestion induced by the application of heat was found to persist for several hours, and in some instances for several days.— *New England Medical Monthly.*

**A Criminal Family.**— In Chester, Eng. (*Medical News*), there recently died a man who had distinguished himself by appearing before the city justices one hundred and thirty times in the capacity of a criminal. His father had been tried thirty-five times, one sister sixty-seven, and another twenty-nine times, making a grand total for the family of two hundred and sixty-one trials. The estimated cost of these trials was ten thousand dollars.

This is only one example of the many cases of inherited criminal propensities, a knowledge of which must extend to the masses before popular opinion will demand that the state shall provide for this class of defectives as it now does for the insane.

**Ice-Cream.**— The British Institute of Preventive Medicine has dealt a deadly blow to ice-cream. A very exhaustive inquiry regarding the nature and adulterations of this toothsome substance has just been completed by Dr. Mac Fayden and Mr. Collyer, F. I. C. These gentlemen tell us that ice-cream has only 26.5 per cent. of solids, the rest being water; that the solids consist of fats, four per cent.; sugar, twelve per cent.; starch, six per cent.; albuminoids, four per cent.; and mineral matter, one-half per cent.

This all sounds well enough, and would lead the unwary reader to think that ice-cream was all right; but the denouement comes in the results of microscopic research. The microscope shows the presence, in London ice-cream at least, of bedbugs, bugs' legs, fleas, straw, hair, coal-dust, woolen and linen fiber, tobacco, epithelial scales, and muscular tissue. Even the microscopical examination, however, is delectable compared with the results of bacteriological studies. These reveal in street-barrow ice-cream a maximum number of seven million microbes per cubic centimeter, while the ice-cream of the shops has only one million per cubic centimeter. The character of the micro-organisms is extremely mixed. There are the bacteria coli commune, besides spirillæ and putrefactive microbes of various kinds.

We find no account of the chemical analysis, which would perhaps add the final touch to the pathological picture of the ice-creams of the shops. In this country it is known that ice-creams chemically contain a poison known as tyrotoxicon, but in London, it seems, that with the bugs and the microbes and the filth generally, there is no need of further research to prove that the ice-creams of the peddlers and the streets are not fit to eat. It would be a manifest injustice to the ice-cream industry, however, to suppose that the supply which is furnished to the American public is at all comparable to that which has been investigated by the English authorities. — *Medical Record.*

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**Ancient Antitoxin.**— There is nothing new under the sun. Pliny says that Mithridates, king of Pontus, made himself proof against poisons by gradually accustoming himself to them. This he did by taking a mixture, the principal ingredient of which was the blood of the Pontic duck, which was said to live on poisons. Thus the blood of one immune animal was used to make another animal immune.

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**Epilepsy from the Use of Tobacco.** —J. W. Scott, M. D. (*S. W. Med. Rec.*), reports a case of convulsions, epileptiform in character, due to the use of tobacco. For two months the patient had had one or two convulsions a week, and they were growing progressively worse in spite of treatment. With the discontinuance of tobacco the convulsions ceased, and have not returned.

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**A New Danger in Beef Tea.**— According to the *Chemist and Druggist*, a whole family at Ballinasloe, with one exception, were committed to the district lunatic asylum raving mad. The outbreak has been traced to beef tea, of which all the family, save the one mentioned, had partaken the previous day.

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**The Sweet Pea vs. Flies.**— A writer in the *Medical Record* is responsible for the statement that the odor emanating from the flower of the sweet pea is so offensive to flies that it will drive them out of the sick-room, though it is not usually in the slightest degree disagreeable to the patient. It is therefore recommended that sweet peas be placed in quantities in the sick-room during fly-time.

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**The Gastric Juice in Tabes Dorsalis.**— Nuchard and Boret have recently reported some cases of tabes associated with gastric crises, in which they made careful examinations of the gastric juice.

They found great variability in the reaction of the gastric juice, the changes in reaction occurring with great rapidity, so that a patient who had had a hyperacid gastric juice for a week or more would suddenly be found to have a subacid one, and vice versa. From the character and rapidity of these changes they regard it as very difficult to explain the lesion present upon anatomical grounds. The authors are inclined to think that this great variability in reaction may be a valuable diagnostic point in distinguishing gastric crises with hematemesis from wound-ulcer of the stomach.—*Le Progrès Médical, Feb. 15, 1896.*

**Hiccough Cured by Traction of the Tongue.**— It is stated by Professor Lepine, of Lyons (*La Semaine Médicale*), that he has arrested and cured a case of hiccough of four days' standing by drawing the tongue out, and keeping it outside of the mouth for a few minutes. It has been observed that rhythmic traction of the tongue excites the respiratory center in cases of asphyxia. The question may be asked, How can these tractions inhibit this center? Professor Lepine, by some experiments, has shown that the result of excitation depends, in great part, on the state of the nervous apparatus concerned; so that, while excitation of the nerves at the base of the tongue will excite the respiratory center when this is paralyzed, similar excitation will depress it if it is in a state of exaggerated excitability.

**Pernicious Effects from the Bromides.**— Dr. S. Weir Mitchell (*University Médical Magazine*) notes among the effects of the use of bromides, increase of irritability or melancholy at menstruation, bad temper, suicidal or homicidal tendencies, temporary delusions in trauma affecting the brain, and in exceptional cases melancholia rising to the grade of danger and occasioning suicidal impulses. In one instance, when irritability followed the use of bromides, excitability could be as easily and more quickly awakened by the smallest amount of alcoholic stimulus or by the large use of tobacco.

**Camphor Intoxication.**— It is reported that a woman was recently discovered in the streets of St. Louis in a state of complete intoxication and unconsciousness as the result of the excessive use of camphor, to which she was very much addicted. Camphor-eating is one of the new developments in drug addiction.

**The Corpuscles of Human Blood.** — Dr. Whitney, of Boston, according to the Boston *Medical and Surgical Journal*, says one cannot make an absolute identification, and say, "This is human blood;" but it may be said, "This is consistent with human blood." This is an important admission, in view of the consequences heretofore of claiming that certain blood stains and corpuscles were positively and absolutely human blood-stains and corpuscles. If such marks are only "consistent" with human blood, to swear away a man's life upon such evidence is little less than criminal.—*The Medical Examiner, July, 1896.*

**Treatment with Serum from Convalescents.**— Weisbecker has observed (*Therap. Wochenschrift*, June 28) that if serum taken from patients recovering from measles be injected into others during the stage of incubation, the incipient disease is much modified, and cases of measles and pneumonia sometimes arrested. He urges others to make experiments of this nature in scarlet fever, measles, etc.

**Oxygen after Ether.**— Dr. Morrison recommends the inhalation of oxygen as a means of relieving the unpleasant effects following ether administration. He finds that the best means of administering it is by means of a catheter passed through the nose.

**Therapeutic Use of the X-Ray.**— Recent observations seem to show that the X-ray is capable of producing physiological effects. Long exposure of the skin to the influence of the X-ray produces pain, swelling, blistering, and discoloration, similar to the effects of sunburn.

**The Causes of Death in Prominent Persons.**— Dr. Michel has been looking up this subject, and has reported many interesting facts in the *Canadian Medical Review*. The following statements he believes to be accurate: Lord Bacon died of pneumonia, aged sixty-five; Ben Jonson, of apoplexy; Benjamin Franklin, of abscess in the lung, aged eighty-four; Washington, of acute laryngitis, aged sixty-seven; Edward Gibbon, of hydrocele, aged fifty-seven; Napoleon, of cancer of the stomach; Thomas Gray, of gout, aged fifty-four; Robert Burns, of rheumatism, aged thirty-seven; Lord Byron, of heart-disease, aged thirty-six; Martin Luther, of gastritis; Cromwell, of intermittent fever; Sir Walter Scott, of apoplexy; Shelley, by drowning; Keats, of consumption; John Milton, of stone in the bladder; Voltaire, of stranguary, probably due to enlarged prostate.

**Women Less Sensitive to Pain than Men.** — Ottolenghi (*Centralblatt für Nerv. u. Psych.*, No. 7) has been making an extensive investigation of the comparative sensibility to pain in men and women. As the result of his investigation, he concludes as follows: —

1. Women are less sensitive to pain than men.

2. Sensitiveness is less in early life, increasing to the twenty-fourth year, and decreasing afterward.

3. The more highly cultivated classes are most sensitive to pain; degenerates are less sensitive, some of them being very obtuse to pain sensations.

4. Sensibility to pain varies between much greater limits in women than in men, the ability to endure pain reaching a limit far beyond the limit in men.

5. General sensibility is greatest in the nineteenth year.

6. General sensibility depends upon the peripheral nerves.

7. The lesser sensibility to pain in woman is an indication of her inferiority to man, as the uncivilized are less sensitive than the civilized, and degenerates less sensitive than normal individuals.

8. Lessened sensibility to pain in woman is related to her greater longevity.

**Massage in the Treatment of Joint Fracture.** — Pello (*Archiv di Ortoped.*) draws attention to the value of early massage and passive movement in the case of intra-articular fractures. He believes that the usual method of treatment by prolonged fixation delays recovery, and only too often leads to ankylosis. He then reports three cases where massage was practised at once, and where the only fixing apparatus was a starched bandage freely cut away so as to allow of the massage. The first case was that of a boy, aged six, with intra-articular fracture of the trochlear process of the right humerus. Light massage was practised at once, and gave much relief to the pain; the joint was then put up in a starched bandage. The next day a good part of the bandage was cut off, and twenty minutes' massage practised. On the fifth day slight passive movement of the joint was begun. On the tenth day the bandage was discarded; at the end of the month the elbow was as free in its movements as before the fracture. The second case was that of a man, aged thirty-eight, with Colles' fracture, who was treated in a similar way and completely cured, with free movement and no deformity, on the fifteenth day. The third case was that of a man, aged forty, who fractured his tibia and patella. The tibial fracture was treated in the usual way; the patellar fracture was unrecognized at the time, and after seventy days' treatment, when the patient was first seen by the author, although the tibial fracture was healed, the limb was useless, as the patellar fragments were distant two centimeters, and only worked by weak fibrous union. Massage was practised, and after fifteen days the patient could walk with crutches, the edema had disappeared, and flexion of the knee (previously rigid) could be obtained. At the end of a month the patient could walk well with a simple stick; in two months he could walk up-stairs so that no one would suspect there had been any injury to the limb. — *British Medical Journal.*

**An Easy and Ready Method of Circumcision.** — John W. Ross, surgeon of the United States Navy (retired), says in the *Medical Record*, Aug. 31, 1895: "Retract the foreskin; insert the glans penis up to the corona into the open mouth of a glass test-tube, draw the foreskin well forward over the end of the tube, tie a strong, small silk cord very tightly around the foreskin, immediately in front of the flange of the tube; amputate the foreskin one eighth of an inch in front of the constricting cord by a circular sweep of the knife; unite the mucous and cutaneous edges of the stump of the prepuce by eight or ten fine interrupted sutures; cut the constricting cord, remove the tube, cover the cut edges well with powdered idoform; encircle the anterior half of the penis with a roller bandage of iodoform gauze, allowing the meatus to project slightly for facility of urination without soiling or removing the dressing, and keep the patient in bed, with penis elevated, from twenty-four to forty-eight hours."

**Rabies in Cats.** — It is not well known that cats, as well as dogs, are subject to rabies. At the Pasteur Institute, in Paris, one in twenty of all the cases treated are due to the bites of rabid cats.

**Ichthyol in the Treatment of Ozena.**— Our Vienna confrères (*La Semaine Médicale*, August, 1896) have been very successful recently in the treatment of ozena with ichthyol. It is claimed that the fetid, offensive breath can be more rapidly and completely removed by ichthyol than with any other known remedy. After first cleansing thoroughly with some alkaline solution to remove the crusts and inspissated mucus, the nasal cavities are flushed with a two to five per cent. aqueous solution of ichthyol, precautions being taken to avoid the disagreeable features of the nasal douche. A cotton applicator, supplied with a twenty-five to thirty per cent. solution of ichthyol, is then applied to the mucous membrane of the affected areas, both anterior and posterior nares being thoroughly swabbed. It has also been recommended in the treatment of pharyngitis siccus.— *The Laryngoscope.*

**Spirits of Turpentine in the Treatment of Burns.**— M. L. M' Innis (New York *Medical Record*) says that spirits of turpentine applied to a burn of either the first, second, or third degree will almost at once relieve the pain. The burn will heal much more rapidly than by any other treatment in the author's experience. He applies the turpentine as follows: After wrapping a thin layer of absorbent cotton over the burn, he saturates it with the common commercial turpentine, which is generally found in every house, and then bandages. Being volatile, the turpentine evaporates, and it is therefore necessary to keep the cotton moistened with it. When there are large blebs, he opens them on the second or third day. It is best to keep the spirits off the healthy skin if possible, as sometimes pain is produced by its action.

**Persian Cure for Dysentery.**— Surgeon-Major T. S. Avetoon, of the British army in India, communicates to the London *Lancet*, a prescription from a medical work in the Persian language, which he says he has used successfully, with a slight modification, in about thirty cases of dysentery, during a little over two years. The dose is a dram of cinnamon bark reduced to a fine powder and made into a ball with a few drops of water, and is repeated morning and evening until a cure is effected. He says that his patients have often been cured with one or two doses, and his worst cases with five. The powerful antiseptic and germ-killing property of cinnamon will be recalled in this connection.

**Prostatic Hypertrophy.**— In a paper read before the British Medical Association at its recent meeting, Dr. Mc Ewen stated that he had operated in five cases, three by double orcheotomy and two by resection of the vas deferens. His conclusions were: 1. In many cases castration causes more or less atrophy of the prostate. 2. Atrophy occurs most commonly when the prostate is soft. 3. It is of most value when the enlargement is general. 4. Cystitis may be relieved or cured. 5. In marked cystitis, drainage is better. 6. It may do away with the necessity for the use of the catheter. 7. Or the catheter may be required less frequently. 8. Resection of the vas deferens acts more slowly, but the effect is similar.— *British Medical Journal.*

**Thermo-Therapeutics of Gonorrhea.**— Neisser has stated that the gonococcus loses its power of development at a temperature of 113° F. Callari (*Gaz. Degli Osp. e Degli Clinic*) has found that the normal male urethra will bear this temperature, and the female two degrees higher. He has been treating gonorrhea with injections at 113°, and reports a progressive disappearance of the gonococci in the majority of cases with this treatment. In order to avoid unnecessary congestion, he injects a six-per-cent. solution of cocain ten minutes before.

**Diuretic Solution.**—

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|---|---|
| Sugar of milk | 100 parts. |
| Lactic acid | 15 " |
| Water | 500 " |

Use as a beverage at frequent intervals.

**Danger from Digitalis.**— Dr. A. Jacobi recently called attention to the fact that digitalis should be carefully avoided in aged persons because of its action on the arterioles of the heart, whereby the general nutrition is impaired.

# BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE AND BACTERIOLOGICAL REVIEW, from original sources.]

**How to Distinguish the Smegma Bacillus from the Tubercle Bacillus.** — Grethe (*Fortschr. der Med.*, May, 1896) points out the need of some simple method of differentiating the smegma bacillus from the tubercle. The inability to distinguish between these two germs has led to serious results in a number of instances; in one case a supposed tubercular kidney was removed, but upon subsequent examination it was found that there was present only calculous pyelitis. In this case supposed tubercle bacilli were found in the urine. A number of other cases have been reported in which similar errors have occurred.

Grethe has found that reliable results are obtained by staining with a concentrated alcoholic methylene blue. This stains the smegma bacillus well; and if the preparation be first stained in the ordinary manner with carbol fuchsin, the tubercle bacillus, if present, is easily identified by its red color contrasting with the blue of the rest of the preparation, including the smegma bacillus.

**Cerebrospinal Meningitis.**— Heubner (*Deut. Med. Woch.*, July 2, 1896) observes that the view which would attribute the epidemic disease to the pneumococcus is not satisfactory. Weischelbaum found in one epidemic a special micro-organism occurring in twos and fours. They lay with their broad sides apposed and not lanceolate. It was found chiefly within the cells; hence the name "meningococcus intracellularis."

Heubner has had a case in his clinic in which it was possible to demonstrate the presence of this micro-organism both during life and after death in an infant, aged one and one-half years. By spinal puncture a turbid, and sometimes distinctly purulent, fluid was obtained, and in the pus cells a diplococcus or tetracoccus was found. This micro-organism was then obtained in pure culture. The injection of the fluid (obtained by spinal puncture) into the vertebral canal gave negative results in rabbits and guinea-pigs. In a young dog the result was doubtful, but in two goats a meningitis was produced, and the meningococcus was obtained from the exudation. Thus in susceptible animals, as in man, the meningococcus produces the same disease.

The author showed by injecting the pneumococcus obtained from a pleural effusion that the virulence of the meningococcus was less than that of the pneumococcus. This corresponds with clinical experience, which shows that a pneumococcus meningitis is rarely recovered from, the fatal result occurring in a few days. In epidemic cerebrospinal meningitis, on the other hand, only one third to one half of the cases prove fatal. The recognition of this form of meningitis by the help of spinal puncture is of considerable importance.— *British Medical Journal.*

**The Pathogenic Action of the Micro-organisms of Friedlander and Fraenkel.**—Fleroff (*Th. de Moscou*, 1896) points that before the discovery of the Talamon-Fraenkel pneumococcus, Friedlander described a bacillus which for a long time was considered to be the agent of pneumonia. More recently this rôle has been given exclusively to the pneumococcus of Fraenkel, although the latter is found as a saprophyte in the mouth, and though in many cases of pneumonia it has been impossible to prove its presence. This investigator has made experiments with a view to determining the real pathogenic importance of these two microbes, and has found that while either of them may cause pneumonia, septicemia, or extra-pulmonary trouble, the pneumococcus seems to be more toxic, but that its presence in the expectoration is not pathognomonic. He concludes that neither of the two microbes ought to be considered the specific agent of pneumonia.

**Typhoid Bacilli in a Five-months Fetus.**— Etienne, of Nancy (*Gazette Hebdom. de Méd. et de Chir.* No. 16, 1896), examined a five-months fetus which had been delivered on the twenty-ninth day after typhoid fever had declared itself in the mother. The child's spleen and intestines, as well as other organs, showed no evidence of the disease, and the placenta was healthy. Blood from the right side of the heart, and from the spleen, the liver, and the placenta, was carefully examined, and cultures were made in

which the typhoid bacillus was found in abundance. The fetus had really died of typical acute blood-poisoning from a large dose of the bacillus before the occurrence of any local change.

**Bacillus of Measles.**— J. Czajkowski (*Centralblatt für Bakteriologie Parisitenkunde*, 1896, XVIII, Nos. 17 and 18) states that he believes he has found the bacillus which produces measles. He examined the blood of fifty-six patients having this disease, thirty-seven specimens being examined microscopically, and cultures made in nineteen cases.

The bacilli, like those described by Pielicke and Cannon, were thin rods varying in length from 0.5 up to the diameter of a red-blood corpuscle; they are extra-cellular.

They are stained irregularly by all aniline dyes.

Cultures grow on various media, but not upon gelatin or agar. Blood added to the media increases their development. In solid media the cultures first show on the third or fourth day in the form of dewdrop colonies. A media composed of sterilized serum from the abdominal cavity seems best suited to their culture, and in this the colonies form a heavy sediment, varying from a white to a yellowish-gray color. They thrive best at blood temperature.

Rabbits are immune; mice die of septicemia from a subcutaneous injection in three or four days. The bacilli were recovered from the blood, liver, and spleen in pure cultures.

**Fatal Septicemia due to the Micrococcus Tetragenus.**— Chauffard and Rémond (*Arch. de Méd. Ex.*, p. 309, 1896) point out that the virulence of this micrococcus, which has been found in the mouths of healthy persons, and was detected by Koch in tuberculous cavities, is proved by numerous recorded cases, in which it has caused suppurations, generally in the cervico-facial or cephalic regions. In the two following cases its effects were fatal: —

A girl of fifteen years died with typhoid symptoms about eight weeks after the beginning of a severe influenza; the necroscopy showed multiple suppuration of the joints, acute purulent pericarditis, abscess of the myocardium, pulmonary infarcts, and abscesses of the liver and kidneys. All the abscesses had a typical appearance of fatty caseation, and the brown effusions in the pleura and pericardium had numerous oily drops on their surface. The tetragenus was present in all the lesions. A young boy of eight years also died with symptoms of secondary infection, following suppurative arthritis of the right knee, which, when aspirated, gave a pure culture of the M. tetragenus. The microbe was also found (with others) in the scrapings of an ulcer on the patient's tongue opposite a carious tooth. In both cases the cultivations of the micrococcus proved virulent to animals, and the pus in the consequent abscesses had the same characteristic appearance.

**Tuberculosis in Goats.**— From the following it will be seen that the hitherto accepted theory that goats are immune to tuberculosis is not altogether correct. Bulling (*Indian Medical Record*) records a case of pulmonary tuberculosis in a goat. Both lungs were adherent, and large and small tuberculous foci were present. The author concludes that it would be well to examine into the possibility of the transmission of tuberculosis through the agency of goats, and to consume their milk only after boiling, or after the goat has been shown to be free from tuberculosis by the absence of reaction after the injection of tuberculin.

**Herpes Facialis as a Symptom of Bacterial Intoxication.** — Friedreich (*Berlin. klin. Wochenschrift*, 1895, Nos. 49 and 50) made some experiments with cultures of streptococci, as used by Coley in the treatment of malignant disease. In seven cases herpes facialis was observed. All these were cases in which sterilized cultures of streptococcus and prodigiosus were used. The eruption appeared not earlier than thirty nor later than fifty-eight hours after injection, and in two cases was followed by recidiva. As there was no infection in these cases, the herpes must be considered as due to intoxication.

COHN says a single germ is capable, under good conditions, of multiplying in three days to 4,772,000,000,000,000, thus making a mass weighing 7500 tons.

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## SCHOOL SANITATION.

A FEW weeks ago the writer undertook to make a little investigation for the purpose of ascertaining the opinions of leading public men upon several questions of importance pertaining to the sanitary condition of schools and school children, and to this end sent out a circular letter containing the following questions: —

1. Should every public school in the poorer districts of the city have a bath department or lavatory? and should personal cleanliness be enforced by the teachers?

2. Should every public school have connected with it a health department, with a qualified physician at the head of the same? and should the building occupied as a public school and the pupils attending the public school be regularly examined with reference to health and sanitary conditions?

3. Should teachers be required to give special attention to such matters as the proper attitude in sitting, the correct method of breathing, and the development of a fine figure, and a dignified physical bearing?

4. Is it not evident that the children attending our public schools are exposed to deteriorating influences which might be eliminated by proper rules and regulations for conserving the health of students? and should not such rules and regulations be enforced in every school?

We publish herewith the reports thus far received, and others are coming in daily. It is certainly encouraging that our governors, members of Congress, and other men in high official positions are giving so much attention to the subject of school sanitation; and it is especially a matter of congratulation that opinions are so unanimous upon questions of leading importance with reference to the necessity for greater attention to the sanitary conditions of human beings during the school period of their lives.

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Hon. John T. Rich, governor of Michigan, replies to our questions as follows: —

1. "Emphatically, Yes.

2. "I should think it would hardly be necessary, at this time, when health matters are receiving so much attention from every one.

3. "I think they should."

4. "Yes."

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Hon. John E. Rickards, governor of Montana, replies in the affirmative to all the questions.

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Hon. O. Vincent Coffin, governor of Connecticut, replies as follows: —

1. "(Should personal cleanliness be enforced by teachers?) Yes.

2. "(Should the building occupied as a public school and the pupils attending the public school be regularly examined with reference to health and sanitary conditions?) Systematic and adequate attention should be given to the points referred to in the clause I have placed in parenthesis.

3. "Yes.

4. "It must go without saying that it is very desirable to eliminate 'deteriorating influences,' and it necessarily follows that such reasonable and practical rules and regulations as will materially aid in that direction should be adopted and enforced."

From Hon. A. W. M'Intire, governor of Colorado: —

1. "Yes, of course.

2. "Wherever practicable.

3. "Certainly.

4. "Obviously, Yes."

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From Hon. William C. Oates, governor of Alabama: —

1. "Yes, certainly.

2. "Yes; but one physician could serve several schools, and that would be cheaper.

3. "Yes.

4. "Yes."

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From Hon. L. F. Magann: —

1. "I am in favor of public baths in the poorer districts of large cities.

2. "I would not favor the maintenance of sanitary inspectors in connection with the school system.

3. "No."

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From Hon. Elijah A. Morse, of Massachusetts: —

1. "To this question, I say, Most certainly; personal cleanliness should be enforced, not only for the pupil's own sake, but for the comfort and health of the other pupils as well. Cleanliness is next to godliness.

2. "It is certainly very desirable to have a qualified physician examine the pupils with a view to discovering predisposition to disease, especially with reference to pulmonary troubles, in order that the parents of poor children especially might be advised to take measures to defend the health of their children by warm wraps and dry feet and other precautions against this insidious disease.

3. "Yes. Many a boy or girl is made round-shouldered for life by an improper attitude while at study. The body is the temple for the indwelling of the Holy Ghost, and a good figure and dignified physical bearing is an important adjunct to success in life.

4. "Most undoubtedly. Too much attention cannot be paid to this important matter."

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From Fred T. Dubois, U. S. Senate: —

"There can be but one answer to these questions; viz, in the affirmative. I would add to the requirements mentioned, a thorough athletic training, under proper supervision."

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From Hon. Henry M. Baker: —

1. "Yes, to the first clause, whenever a bath department or lavatory can be procured without diminishing the number of school days or the quality of the instruction. The idea is entirely right. To the second clause, I unhesitatingly answer, Yes.

2. "To the first question under item No. 2, I say, No. To the second, Yes.

3. "Emphatically, yes.

4. "There should be no 'deteriorating influences' in our public schools, and in my opinion they are singularly free from them, except the evil which must necessarily come from the home into the school, so long as it exists there. Therefore proper rules and regulations should be prepared and enforced, not only to conserve the health of the students, but to improve their manners, language, and entire conduct while in school or on the school grounds. That done, the home will be reached, and, in many instances, improved."

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Hon. D. G. Colson answers "Yes" to all the questions.

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Hon. A. R. Kisfer replies as follows: —

1. "Yes, whenever the school funds will permit. Personal cleanliness should be enforced by teachers.

2. "Answer same as No. 1.

3. "Absolutely.

4. "Yes."

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At the same time a circular embodying the following questions was sent to the

superintendents of schools in a number of the principal cities of the United States: —

1. What is your opinion of the necessity for the medical supervision of public schools?

2. Should the pupils in public schools have some sort of medical examination on entering the school, and at stated intervals of a few months, or at least once a year, while in the school?

3. Do you consider a bath department or lavatory essential for a public school building? If so, what is the teacher's duty with relation to the matter of cleanliness of pupils?

4. Do you know of any public school which maintains a bath department for the use of its pupils? If so, kindly give the address of same.

5. Do pupils of the schools under your supervision receive regular instruction and training in proper breathing, and proper position or attitude in sitting, standing, or walking?

6. Are systematic gymnastic exercises a regular part of the day's program in your schools? or if in part of the schools, and not in all, in what proportion?

The following are the answers received to the above questions. The reader will be impressed with the unanimity of opinion respecting the necessity for radical reforms as to the sanitary care of children in the public schools. It is also gratifying to note that in some schools something is already being done in this line.

From Buel T. Davis, superintendent of public schools, Oshkosh, Wis.: —

1. "There should be such supervision.

2. "Yes.

3. "It would be a good thing, if properly organized.

4. "I know of none.

5. "This is not thoroughly or systematically done.

6. "Such exercises are recommended, but are not as systematically carried out as they should be."

From W. E. Robinson, superintendent of public schools, Detroit, Mich.:—

1. "It would be a good thing if the proper amount of funds could be secured.

2. "As per No. 1.

3. "It is the teacher's duty to see that pupils are kept clean.

4. "We have had, for eight or nine years, a bath department in connection with our truant school. It should always be a shower bath.

5. "Yes.

6. "Yes."

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From A. W. Carley, superintendent of public schools, La Crosse, Wis.: —

1. "Good, if wisely done.

2. "Yes.

3. "It is desirable." To the last clause he answers, "To see that they are clean."

4. "Yes, some Milwaukee schools,— Milwaukee Normal, West Superior Normal.

5. "Yes.

6. "Yes."

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From W. S. Perry, superintendent of public schools, Ann Arbor, Mich.: —

1. "I would not place medical supervision of public schools among the necessities, but I would have every teacher endeavor to secure the best possible health conditions of his school.

2. "Yes, to this extent, that all pupils should be required to present a certificate of vaccination before entering a public school.

3. "I never have taught in or had charge of a school where I thought it wise to recommend a bath department; neither would I permit uncleanliness in schools. That part of child-care is essential, and exclusively a home duty.

4. "No.

5. "They receive quite regular but not adequate instruction in such matters."

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From H. N. Worth, superintendent of public schools, Steubenville, Ohio: —

1. "It would doubtless be beneficial, but is hardly to be called a necessity.

2. "This, like the first proposition, would be a good thing, but the public will have to be educated up to it before it will be practicable.

3. "To the first part of this, I would make the same answer as to No. 2. To the second part, I would say, It is the teacher's duty to see that the children come to school neat and clean as to person and dress, and that they be instructed in hygienic principles requiring such cleanliness. But the home environment is too often a factor in fostering uncleanly habits.

4. "No.

5. "Yes.

6. "Yes."

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From H. A. Simons, superintendent of public schools, Steven's Point, Wis.: —

1. "Very important, if the supervision is made by a competent official.

2. "Yes, if the examiner is competent.

3. "A lavatory is the least facility a school should furnish.

4. "No.

5. "Not regular instruction.

6. "No."

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From D. K. Goss, superintendent of public schools, Indianapolis, Ind.: —

1. "It depends upon circumstances.

2. "If such examination is a real examination, yes.

3. "No.

4. "No.

5. "Yes.

6. "A regular part of the instruction throughout."

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From F. D. Lyon, superintendent of public schools, Mansfield, Ohio: —

1. "Excellent, especially for eyes and ears.

2. "I think it would be well.

3. "Very desirable.

4. "No.

5. "Yes.

6. "We have systematic physical culture exercises; they form a part of the daily program."

---

From S. C. Price, superintendent of public schools, Mt. Clemens, Mich.: —

1. "A good thing — perhaps the best.

2. "Yes.

5. "Yes, each day.

6. "In all departments."

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From J. B. Estabrook, superintendent of public schools, Racine, Wis.: —

1. "I believe that the introduction of medical supervision into public schools would be a marked step in advance, from an educational and physical standpoint.

2. "It strikes me that a medical examination of the pupils of the public schools at stated intervals (at least once a year) would be exceedingly beneficial.

3. "A bath department or lavatory, while possibly not essential, would no doubt be a blessing in the great majority of schools. It is the teacher's duty to see that no pupil sits in the schoolroom in an untidy or uncleanly condition. It is not only a bad example, but an actual injustice to the other members of the department, to allow such a pupil to remain seated among them.

4. "I know of no public school that maintains a bath department.

5. "Pupils in the various grades of our schools receive instruction in proper breathing, proper position in sitting, standing, and walking in connection with their lessons in physiology."

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W. P. Hepburn, superintendent of public schools, Clarinda, Iowa, answers all the questions in the affirmative.

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From H. G. Woody, superintendent of public schools, Kokomo, Ind.: —

1. "It would be helpful to provide an expert that is really an expert, not a quack.

2. "Yes, but not essential.

3. "Not an essential, but it would prove a blessing. All our new buildings have wash-basins and mirrors. Teachers should cultivate habits of cleanliness.

4. "No.

5. "Yes.

6. "Yes, in all grades below high school."

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From E. C. Warriner, acting superintendent of public schools, Saginaw, East Side, Mich. : —

1. "Medical supervision and physical training are the greatest needs of our public school system to-day.

2. "Yes.

3. "Not essential, but desirable.

4. "Ishpeming, Mich., high school.

5 and 6. "Yes."

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From Y. N. Study, Fort Wayne, Ind. : —

1. "It would be a good feature in school advancement.

2. "I think so.

3. "A lavatory is an essential in a modern school. As to bathing, I am not so sure.

4. "No.

5. "Yes."

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From W. C. Belman, superintendent of public schools, Hammond, Ind. : —

1. "I think it necessary.

2. "They should.

3. "It is essential, but the practical workings of it are not clear.

4. "I do not.

5. "They do.

6. "We have five-minute exercises each half day, besides the intermission, or recess, of five minutes."

---

From F. E. Converse, superintendent of city schools, Pontiac, Mich. : —

1. "It seems to me to be very desirable.

2. "Yes.

3. "The teacher should teach cleanliness by precept and example. A filthy child should not be allowed to remain so.

4. "No.

5. "I try to secure such through the regular teachers.

6. "In three fourths of the schools."

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From W. G. Coburn, superintendent of public schools, Battle Creek, Mich. :—

1. "I think we should have a medical supervisor in our schools.

2. "At the entrance, and at least once during the year.

3. "I believe each school should have a lavatory.

4. "I know of none on a large scale. We have wash-bowls, towels, combs, brushes, etc., in all the Battle Creek public schools.

5. "We expect to have regular instruction this year in the above-mentioned exercises.

6. "A regular part."

---

From F. R. Hathaway, superintendent of public schools, Flint, Mich. : —

1. "I don't think it necessary.

2 and 3. "No.

4. "Ishpeming, Mich.

5 and 6. "Yes."

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From S. B. Laird, superintendent of public schools, Lansing, Mich. : —

1. "I believe the necessity for medical supervision of public schools exists, and that it is imperative.

2. "Pupils should be examined on entering school as to health of eyes, ears, and nostrils at least, and perhaps again at the beginning of the second semester.

3. "A bath would be a promoter of health and cleanliness, hence of better morals.

4. "No. The pupils of our schools have a certain measure of instruction along these lines, but it is not systematized upon physiological principles.

6. "The ordinary school gymnastics are practised in the grades every day."

---

From W. W. Chalmers, superintendent of public schools, Grand Rapids, Mich. :—

1 and 2. "I have not given sufficient thought to these questions to be able to answer them.

3. "Yes.

4. "Yes, our truant school.

5. "Yes, to the first part.

6. "Yes."

From W. H. Wiley, superintendent of public schools, Terre Haute, Ind.: —

1. "It would be beneficial in many cases.

2. "Such a plan would enable teachers to better guard the health of pupils.

3. "Our teachers insist upon pupils' coming to school in good condition.

4. "To the first part of No. 4, No.

5. "Yes.

6. "We have systematic instruction in gymnastics."

## TOBACCO AND EDUCATION.

A CRUSADE against the use of tobacco has recently been started in a number of our American universities. It is a recognized fact that tobacco, when taken into the system in any form, is injurious not only to the physical health, but to the intellectual development as well. The results obtained in schools where the use of tobacco has been discarded are very encouraging, and show clearly the harmful effect which this obnoxious weed has upon the system. It is gratifying to note that some of the best colleges of our country have taken a decided stand against its use by their students. The Boston University has issued an ordinance that those students who are unwilling to forego the use of tobacco while within the precincts of the university will have their fees returned, and their names taken from the books. The Ohio Wesleyan University has made a rule forbidding its students to use tobacco in any form, and other universities have made similar ordinances.

In some of the higher educational institutions of this country attempts have been made to obtain statistics as to the effects of tobacco on the academic youth. In 1891 the official physician of Yale published the results of observations on the under-graduates of that university. In a class of one hundred and forty-seven students, he found that in four years seventy-seven who did not use tobacco surpassed the seventy who did use it to the extent of 10.4 per cent. in increase of weight, twenty-four per cent. in increase of height, and 26.7 per cent. in increase of chest girth. The most marked difference was, however, in point of lung capacity, the abstainers showing an average gain of 77.5 per cent. more than smokers or chewers. Among the undergraduates at Amherst it was found that during the four years the abstainers from tobacco gained twenty-four per cent. in weight, thirty-seven per cent. in height, forty-two per cent. in chest girth, and seventy-five per cent. in lung capacity, over those who used tobacco. C. E. S.

**Toxicity of the Gastric Juice in Epilepsy.**— Gastric juice obtained from patients suffering from major epilepsy, when injected into rabbits, causes a fall of temperature, slowness of respiration, weakness, general convulsions, and subsequent death. The poisonous properties contained in the gastric juice are most abundant just before and just after an attack of epilepsy, and are in proportion to the duration and violence of the attack. The exact source of this toxic substance is not known; it may be due to primary gastric derangement, or to a disorder of the gastric function caused by some alteration in the nervous system; or it may be some poison excreted by the mucous membrane of the stomach from the blood. Whatever the source of the poisonous material, it would be a rational measure to wash out the stomach in cases suffering from this disease. C. E. S.

# REVIEWS.

PRACTICAL POINTS IN NURSING.— By Emily A. M. Stoney. Philadelphia: W. B. Saunders.

This work is one of the most complete upon the subject of nursing which has yet appeared. The author is a trained nurse, and has evidently had a large practical experience. The work is prepared with a great amount of painstaking labor, and will be welcomed by nurses everywhere as a valuable addition to the practical literature pertaining to the care of the sick. It is especially satisfactory to notice the considerable amount of space given to hydrotherapy. Some of the directions given would perhaps hardly be considered up to the standard of the best usage, but will nevertheless prove serviceable, and, as an introduction to the subject, may be considered invaluable. The majority of text-books on nursing heretofore published have been particularly deficient in information of this nature.

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A PRACTICAL TREATISE ON MEDICAL DIAGNOSIS.— By John H. Musser, M. D. Philadelphia: Lea Brothers & Co.

We do not hesitate to pronounce this work the best volume on this subject which has appeared in recent times. Perhaps the least satisfactory portion of the work is that relating to the examination of the gastric contents. This subject is one to which much attention has recently been given, and which, at the present time, may be said to rest upon a thoroughly scientific basis. The method of Messrs. Hayem and Winter, the only thoroughly reliable and practical method of the study of the gastric fluids, is not mentioned, and no attention is apparently given to the important relation of the combined chlorin to free hydrochloric acid in the estimation of the acidity of the stomach contents. The work is nevertheless an admirable condensation of the most important of the valuable facts and methods of diagnosis at the disposal of the modern practitioner, and it will be welcomed everywhere as a thoroughly up-to-date treatise. The plates, although half-tone, are so admirably executed that it is difficult to distinguish them from the finest lithographs. The work is printed on fine, strong paper, and is an excellent specimen of the splendid bookmaking for which these publishers have long been noted.

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A REVIEW OF DR. WALLACE AND THE RAILWAY SURGEONS ON SPINAL CONCUSSIONS.— By R. M. Swearingen, M. D., Austin, Texas.

This interesting paper is a very sharp but courteous arraignment of those surgeons — particularly surgeons employed by railroads in recent years — who have, with considerable unanimity, and, it must be said, with no small degree of animosity, attacked the views brought forward by Professor John Ericsson, an eminent English surgeon, respecting the spinal injuries which frequently result from railway accidents, and which are commonly included under the general term "spinal concussion," or "railway spine." Dr. Swearingen is an honest and experienced physician, and he takes an honest and unbiased view of this subject, although it is a view not particularly helpful to the railroad companies. No doubt railroad companies, as well as other incorporated bodies, are sometimes imposed upon, but the fact that there are occasional instances of imposture should not be regarded as evidence that every person who claims to have suffered from spinal concussion as the result of a railroad accident is an impostor. Dr. Swearingen has done the medical profession as well as suffering humanity, a service of no small value in the preparation of this able paper.

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A CONCISE DESCRIPTION OF THE ANATOMY AND PHYSIOLOGY OF THE EYE AND ITS APPENDAGES. — Prepared by Ludovic Hirschfeld. New York: H. A. Daniels, M. D.

This little quarto volume of 16 pages comprises a concise and complete description of the eye. Its chief value consists in the large number of beautiful lithographic cuts by which the text is illustrated. These are composed of six plates, each of which is really a work of art. Every detail of the structure of the eye is clearly displayed, so that this organ and the surrounding structures are pictorially portrayed in a manner superior to anything which to our knowledge has been heretofore attempted. The work is one which every specialist will consider indispensable to his library, and there are few physicians who might not find profit in perusing it.

## REPORT OF EXAMINATION OF BLOOD.

FOR NOVEMBER.

| Blood Count. | Men. | Women. | Total. |
|---|---|---|---|
| Over 5,000,000 | 3 | 4 | 7 |
| Between 4,500,000 and 5,000,000 | 29 | 10 | 39 |
| " 4,000,000 " 4,500,000 | 13 | 23 | 36 |
| " 3,500,000 " 4,000,000 | 6 | 5 | 11 |
| " 3,000,000 " 3,500,000 | | 1 | 1 |
| " 2,500,000 " 3,000,000 | 2 | | 2 |
| Totals | 53 | 43 | 96 |

| Hemoglobin. | Men. | Women. | Total. |
|---|---|---|---|
| 100 per cent. | 12 | 4 | 16 |
| 93 " " | 34 | 34 | 68 |
| 85 " " | 4 | 3 | 7 |
| 78 " " | 1 | | 1 |
| 71 " " | | 1 | 1 |
| 65 " " | 2 | 1 | 3 |
| Totals | 53 | 43 | 96 |

**Gastric Laboratory Report for November.**—Total number of analyses, 81; regular analyses, 72; experimental, 9.

The regular cases were from the following States and countries: Michigan, 16; Indiana, 8; Ohio, 8; Illinois, 7; Iowa, 5; Minnesota, 4; Canada, 3; Pennsylvania, 2; Wisconsin, 2; Massachusetts, 2; Nebraska, 2; New York, 2; Missouri, 2; Kentucky, 2; Virginia, 1; Washington, 1; Maine, 1; District of Columbia, 1; South Carolina, 1; New Mexico, 1; Kansas, 1. Total, 72.

**Sputum Examinations for November.**—There were 25 examinations made, 23 of which were new cases. The tubercular bacillus was found in 1 case.

**Urinary Laboratory Report for November.** — Number of specimens examined, 199; number of cases, 133. Number of cases with albumen, 11; pus, 49; blood, 6; casts, 5; sugar, 5; bile, 1. One specimen was tested for toxicity.

**Bacteriological Examinations of Stomach Fluids for November.**—Total number of fluids examined, 90; regular, 81; experimental, 9. Four specimens were received by mail for examination.

# PUBLISHERS' DEPARTMENT.

CHANGE OF NAME.— The editors of *Mathews's Medical Quarterly* announce that with the January issue of that publication its name will be changed to *Mathews's Quarterly Journal of Rectal and Gastro-Intestinal Diseases.* This is a change which has been deemed necessary for some time, as it is essential that the title of a medical journal should convey to the reader an idea of its contents, and this has not been the case with its name from the beginning. There will be no change in the policy of the journal. As it will continue to be the only English publication devoted to the disease and surgery of the rectum and gastro-intestinal tract, the articles appearing in it will be limited to these subjects. The journal will continue to be edited by Drs. J. M. Mathews and Henry E. Tuley, and published in Louisville, Ky.

ANNOUNCEMENT OF THE PASTEUR MONUMENT COMMITTEE OF THE UNITED STATES,— COSMOS CLUB, WASHINGTON, D. C.—It has been decided to erect in one of the squares of Paris a monument to the memory of M. Pasteur. Statues or busts will also no doubt be located at his birthplace and in other cities. The Paris committee has, however, wisely determined that the statue obtained through international effort shall be located at Paris, where it will be seen by the greatest number of his countrymen and also by the greatest number of his admirers from other lands. The officers of the committee for the United States are the following: Dr. D. E. Salmon, Chairman, Chief of the Bureau of Animal Industry; Dr. E. A. De Schweinitz, Secretary, President of the Chemical Society of Washington, Chief Chemist Biochemic Laboratory; Dr. G. Brown Goode, Treasurer, Assistant Secretary of the Smithsonian Institute.

We believe it is unnecessary to urge any one to subscribe. The contributions of Pasteur to science and to the cause of humanity were so extraordinary, and are so well known and so thoroughly appreciated in America that our people only need the opportunity in order to demonstrate their deep interest. All can unite in honoring Pasteur.

The above committee supplies subscription blanks, which should be returned in the accompanying envelope, together with a money-order, check, or draft covering the amount subscribed. All checks, etc., should be made payable to "Treasurer Pasteur Monument Committee," and when received by the secretary, a numbered receipt will be forwarded to the sender The original subscription papers will be forwarded to the Paris committee for preservation.

It is our purpose to do our work as largely as possible through societies or other organizations. We prefer to have each organization appoint one of its members as an associate member of this committee, with authorization to collect and forward the subscriptions. The amounts thus far subscribed by individuals vary from fifty cents to ten dollars. It is hoped that no one who is interested will hesitate to place his name upon the list because he cannot give the maximum amount.

Please let this receive your early attention, and in that way assist our committee, which must co duct correspondence with the societies of the entire country.

# DIRECTORY OF SANITARIUMS.

THE following institutions are conducted under the same general management as the Sanitarium at Battle Creek, Mich., which has long been known as the most thoroughly equipped sanitary establishment in the United States. The same rational and physiological principles relative to the treatment of disease are recognized at these institutions as at the Battle Creek Sanitarium, and they are conducted on the same general plan. Both medical and surgical cases are received at all of them. Each one possesses special advantages due to locality or other characteristic features.

## ST. HELENA SANITARIUM, OR RURAL HEALTH RETREAT,

ST. HELENA, CAL.

W. H. MAXSON, M. D., Superintendent.
IRVING E. KECK, Business Manager.

THIS institution is beautifully located at the head of the Napa Valley. It is a fine large building, with excellent appointments, and all facilities required for the treatment of chronic invalids of all classes. It has also a record for a large amount of successful surgical work. There are several able physicians connected with the institution. The scenery is delightful, the climate salubrious; the water supply, which is furnished by mountain springs, is pure and abundant. Hundreds of cases of diseases generally considered incurable have been successfully treated at this excellent institution during the twenty years of its existence.

## CHICAGO SANITARIUM,

28 COLLEGE PLACE, CHICAGO, ILL.

THIS institution is a branch of the Battle Creek (Mich.) Sanitarium. It is favorably located near Lake Michigan, in the southern portion of the city, close to Cottage Grove avenue, and facing the old Baptist University grounds. A few patients are accommodated. Facilities are afforded for hydrotherapy, and the application of massage, electricity, Swedish movements, and other rational measures of treatment.

## NEBRASKA SANITARIUM,

COLLEGE VIEW (LINCOLN), NEB.

A. R. HENRY, President.
A. N. LOPER, M. D., Superintendent.

COLLEGE VIEW is a thriving village located in the suburbs of Lincoln, with which it is connected by an electric railway. College View is the seat of Union College, one of the leading educational institutions of the West. The Sanitarium has a beautiful location, facing the spacious college grounds, and gives its guests the advantages of a quiet, homelike place, combined with appropriate and thoroughly rational treatment. It has a full equipment of excellent nurses, and has already won for itself an enviable reputation in the West.

## PORTLAND SANITARIUM,

PORTLAND, ORE.

L. J. BELKNAP, M. D., Superintendent.

THIS institution is beautifully located in the center of the city, in a fine building with spacious grounds; and although it has been in operation scarcely more than a year, it already has a good patronage, and has evidently entered upon a successful career. Facilities are provided for the dietetic and medical treatment of chronic ailments of all kinds. The advantages for treatment include, in addition to various forms of hydrotherapy, electric-light baths, and apparatus for the application of electricity in its various useful forms, manual Swedish movements and massage.

## COLORADO SANITARIUM,

BOULDER, COLO.

W. H. RILEY, M. D., Superintendent.

THIS institution is located on a beautiful site of one hundred acres, including a fine mountain peak, and commanding extensive landscape views which, for variety and beauty, can hardly be equaled. The site adjoins the thriving city of Boulder, and is about one hour's ride by rail from Denver, the streets and principal buildings of which are easily discernible from the peaks around Boulder. The equipment consists of a large building especially erected for the purpose, two fine cottages, and every appliance for the application of hydrotherapy, and for the special treatment of pulmonary ailments, to be found in the best establishments of like character. Particular attention is given to the dietetic treatment of patients, and to systematic exercise, in addition to the special treatment for specific ailments. The altitude is between five and six thousand

# Directory of Sanitariums.—Continued.

feet, just that which has been determined to be the best for pulmonary troubles. Though but a few months have elapsed since the work of this institution was fairly begun, a large number of persons suffering from pulmonary tuberculosis have already been cured, and are now rejoicing in sound health. The rational hygienic treatment, with the climatic advantages, has proved effective in the cure of cases which, without the combined advantages of these superior measures, must certainly have succumbed to the disease.

## GUADALAJARA SANITARIUM,

STATE OF JALISCO, MEXICO.

D. T. JONES, Superintendent.

ADDIE C. JOHNSON, M. D.,
J. H. NEALL, M. D., } Physicians.

THIS institution, established in 1894, is the first and still the only one of the kind in Mexico. It affords, in addition to the unsurpassed climatic advantages of the region in which it is located, facilities for the employment of hydrotherapy, electricity, massage, manual Swedish movements, and dietetics, in the treatment of all forms of chronic disease. The altitude is the same as that of Denver,—from five to six thousand feet. Guadalajara has the advantage of a climate more nearly uniform than any other with which we are acquainted. Located in the tropics, it enjoys almost perpetual sunshine, while its altitude is such as to prevent excessive heat. There is probably no better place on earth for a pulmonary invalid. It is only necessary that the advantages of this institution should become known to secure for it extensive patronage.

## INSTITUTE SANITARE,

BASEL, SWITZERLAND.

THIS institution affords the only place in Europe where patients can receive the advantages of a thoroughly hygienic diet, baths, electricity, Swedish movements, massage, and various other methods of treatment, applied after the manner and in accordance with the same principles which govern the Battle Creek Sanitarium and its several branches. The physicians are persons who have received a thorough training in the institution at Battle Creek. Terms are moderate. No better place for sick persons or semi-invalids abroad than the Institute Sanitare.

Address, 48 Weiherweg.


# The Art of Massage

## Its Physiological Effects and Therapeutic Applications.

BY J. H. KELLOGG, M. D.

THIS work is eminently condensed, concise, practical, and covers the whole ground in a manner which the publishers believe will commend itself to all who are competent to judge of its merits. After a brief sketch of the History of Massage, and an outline of the parts especially concerned in Massage, the author gives in twenty pages an exceedingly lucid statement of the physiological effects of Massage, in which the subject is brought up to the latest date. The following chapter is devoted to the Therapeutic Applications of Massage, in which the general indications are clearly pointed out.

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Fifty pages are devoted to the several procedures of Massage, which are considered under seven heads; namely,

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STROKING, KNEADING, PERCUSSION,
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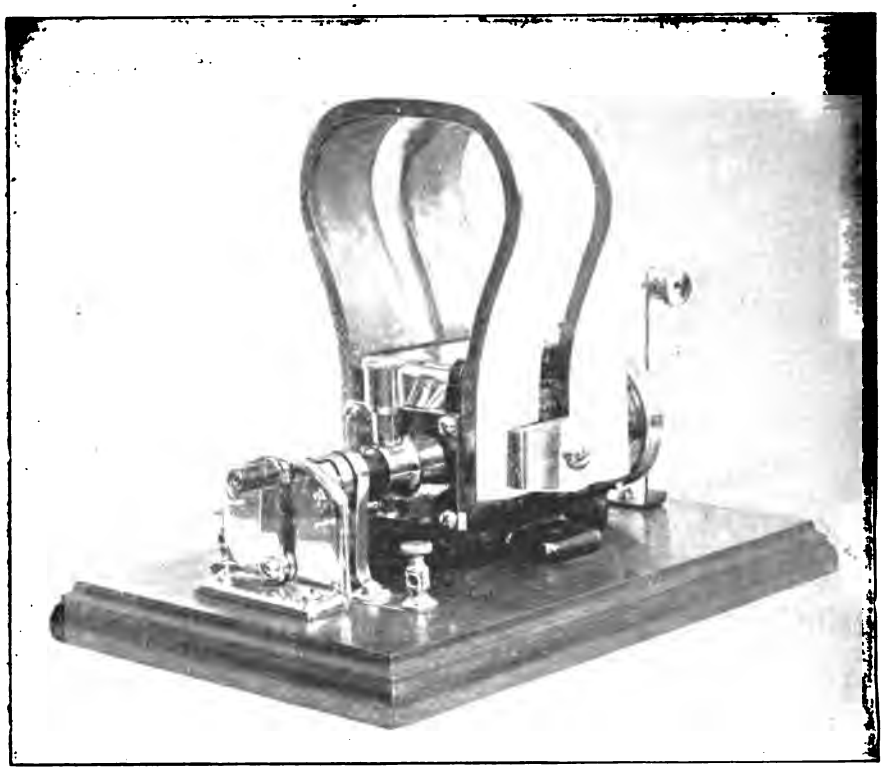

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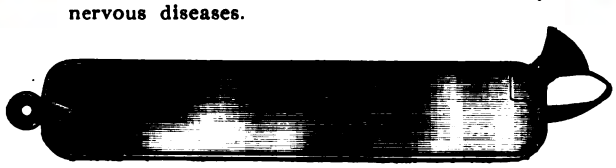

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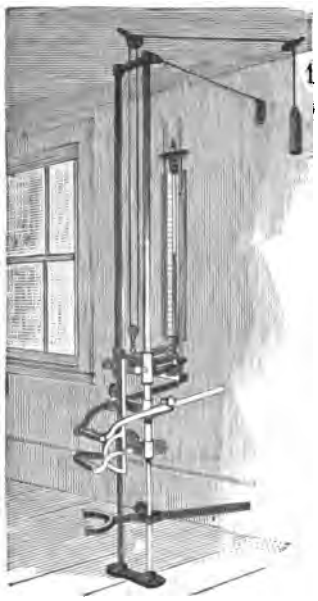

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